Occupational HAZARDS

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THERE'S PROFIT IN PREVENTION

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ROUTE TO
YOUR PLANT
E PROTECTION
EN: ARTICLES
ON FIRE
ROTECTION
R INDUSTRY

A report to Industry on . . .

Cost of Foot and Toe Injuries

SEE PAGE 10

IN THIS ISSUE:

. . . ACCIDENT PRONENESS . . .
SAFETY AROUND ELEVATORS
. . . INDUSTRIAL SOLVENTS . . .

THIS 3 SECTION DUST CONTROL SYSTEM ...provides 3 distinct advantages

1. Economical night shift operation
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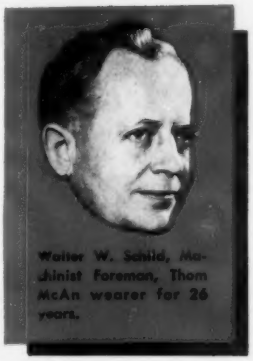

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This deep-seated acceptance of the Thom McAn name not only helps *start* men wearing Safety Shoes, but *keeps* them wearing 'em—a vital factor in the enviable safety records of many wide-awake plants.

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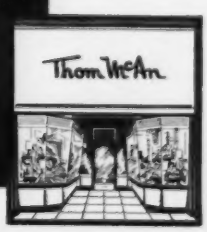

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Safeguard All Hands with **WEST LAN-O-KLEEN HAND CLEANSER**

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Company_____

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14

2½ TONS OF HYDRO EQUIPMENT dropped on this one when rigger slipped as load descended. The sole was outlined in the planking. The steel toe box was flattened on top. But the man's toes weren't even marked.

5500 LB. COIL of strip steel came down too fast and caught the toe of this Lehigh. When they got it up they found the workman had a bruised big toe. No lost time. No compensation.

RR LOCOMOTIVE caught this shoe against a box-car coupling while brakeman was trying to kick coupler into position. It might have sheared his foot off. Toes and instep were only badly bruised.

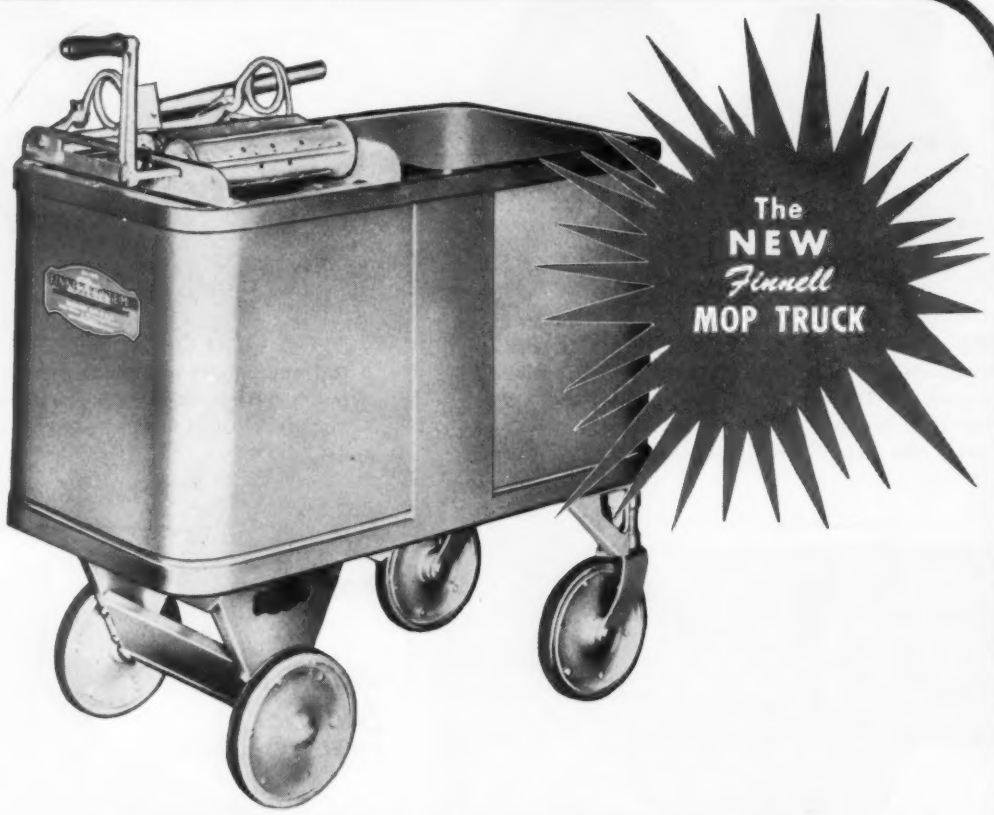
*WRITE TODAY FOR COMPLETE NEW CATALOG SHOWING 43 DIFFERENT STYLES OF SAFETY BOOTS AND SHOES

LEHIGH
SAFETY SHOE COMPANY
ALLENTOWN, PA.

3000 LB. TRACTOR ran squarely over the toe of this one. Note how toe box was partially flattened, but Lockrim held fast. Injury: one bruised big toe.

650 LB. STEEL BILLET fell 4½ feet striking just over large toe. That's 2925 ft. lbs. weight-at-impact. A few minutes time out for examination and employee returned to his job. No injury.

*TM Reg.



It's Streamlined

FOR GREATER CLEARANCE . . . Conserves Storage Space

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A mop shield beneath the wringer of the truck prevents mop from dropping into the dirty water when being wrung. Wringer-rolls are of steel, and the truck has four double-disc pressed-steel wheels, two of which swivel . . . rubber or metal tires . . . and two 28-gallon tanks. Ruggedly constructed to withstand hard usage. Comes in stainless steel and in galvanized iron.

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BRANCHES IN ALL PRINCIPAL CITIES

Occupational HAZARDS

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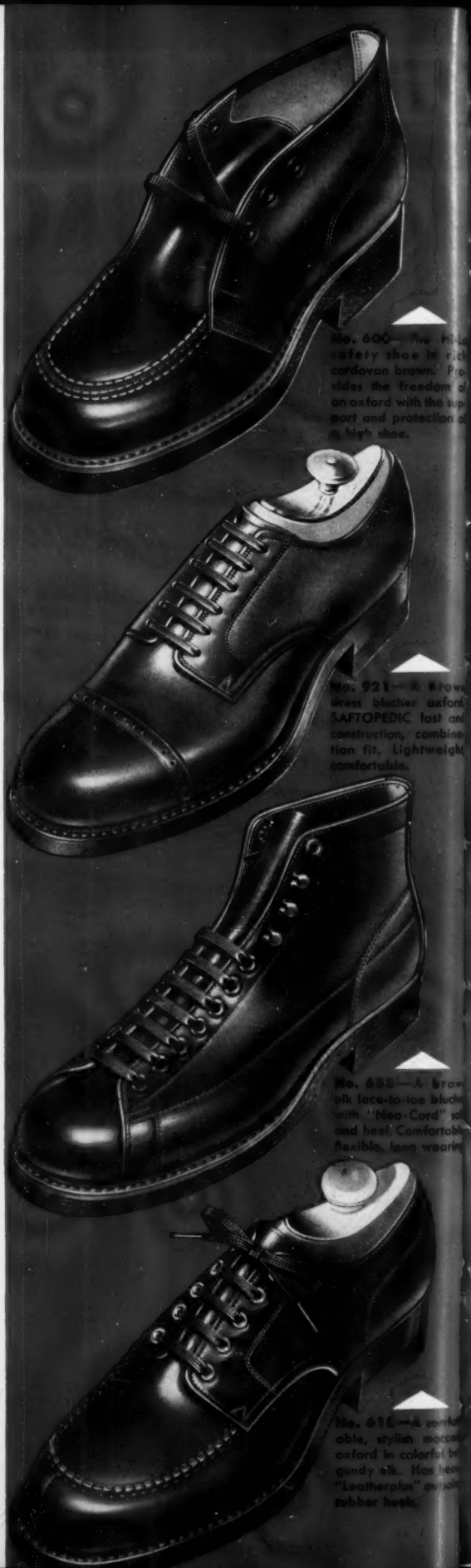
Iron Age pioneered the "new look" and better quality in safety shoes. Iron Age has consistently developed new types of safety shoes to help industry keep safety footwear programs alive and growing.

For employee *action* that reflects credit on your safety record, build your safety shoe stocks from the complete Iron Age line. Our experienced representatives will gladly advise on the scope of your program.



The Safety Shoe for Industrial America

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Gives Your Workers INDIVIDUAL PROTECTION for Each Eye

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(1) It's light in weight for maximum comfort.

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Your nearest AO Safety Products Representative can supply you with this popular goggle which protects from particles striking from every direction.

QUICK FACTS:

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AN ALL-INDUSTRY SURVEY BY OCCUPATIONAL HAZARDS

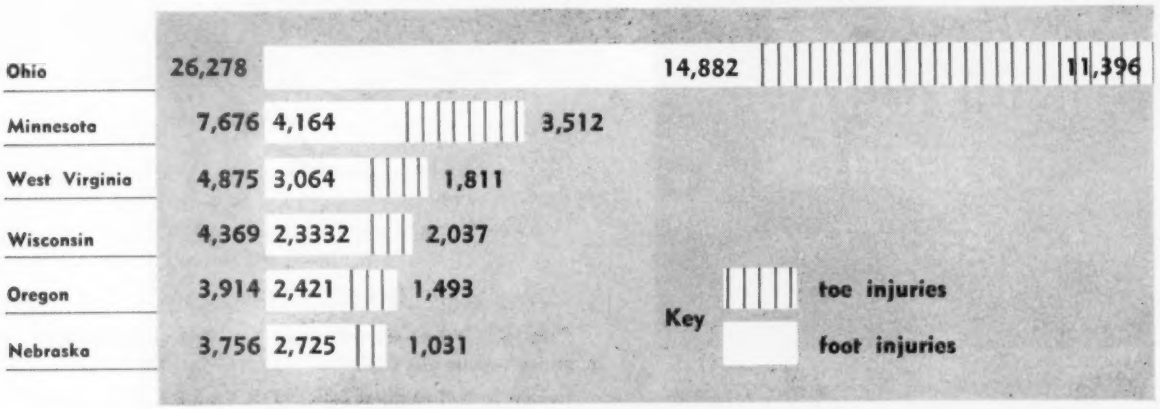
WHAT PRICE

THE FACTS AND FIGURES PRESENTED IN THIS ARTICLE represent the results of a 12-month survey conducted by the editorial staff of OCCUPATIONAL HAZARDS Magazine. In digging for the answers to important questions relative to the *industrial foot and toe injury problem,* over 300 industrial plants of various sizes and classifications were contacted—many by personal interview. In addition, a large number of officials representing various State Industrial Commission and Workmen's Compensation groups were contacted.

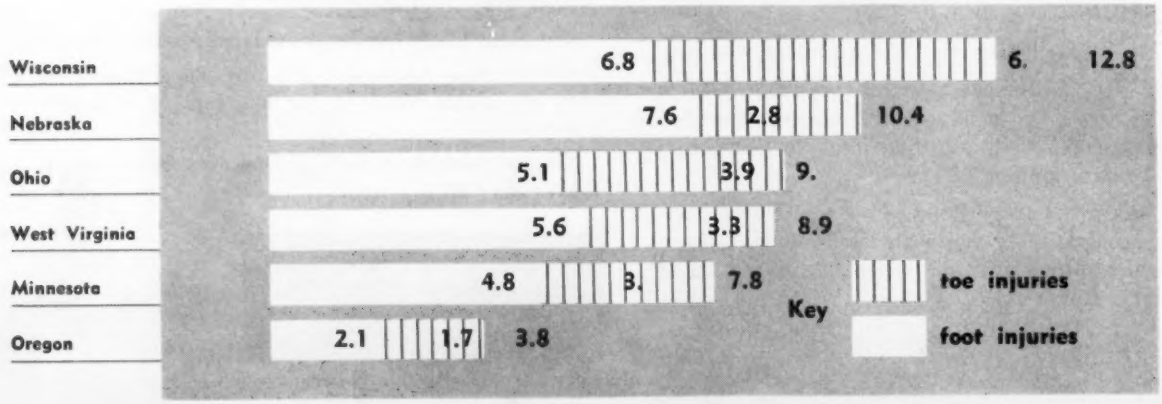
As this survey progressed, it was most encouraging to the editors to note the real interest evidenced in this foot and toe injury problem. Before the survey was a month old, it became apparent that the problem was even more serious than we had anticipated—a problem needing complete airing, and one that requires an immediate solution.

Many superintendents and safety engineers of smaller plants and the larger so-called "non-hazardous" plants seemed amazed to discover just how costly foot and toe injuries were to them

1 *Are foot and toe injuries of sufficient number to cause industry any real concern? What are some typical annual figures as recorded by state compensation groups?*



How do these numbers compare, percentage-wise, with the total number of industrial accidents suffered by these states?



FOOT AND TOE INJURIES?

—even though many of them had suffered only six or less of these injuries during the year. In one small Wisconsin plant, for instance, it was found that only two toe injuries had been suffered during a twelve-month period. One of these, however, happened to be an amputation case and had cost this small company $2,919 and 900 lost days!

The idea of safety shoes seemed to take on a concrete form among those persons cooperating with this magazine in gathering data for this foot and toe injury survey. Mr. Joseph A. Haller, Director of Safety, State Industrial Accident Commission, Maryland, seemed to pretty well sum up the thinking of all when he wrote us in connection with this survey:

"In my humble opinion, safety shoes have not only prevented serious injuries in many cases, but have also prevented many other accidents. The fact that an employee is wearing safety shoes is one indication that he is safety conscious and aware of the possibility of injury. This tends to make him a more safe worker."

Space does not permit us to give individual credit to the many safety directors who supplied us with the information contained in this survey. However, we would like to give special thanks for the aid and cooperation extended us by the following officials: Robert M. Evenden, Director, *Accident Prevention Division, State Industrial Accident Commission, Salem, Oregon;* O. A, Fried, Chief Statistician, *Industrial Commission, Wisconsin;* H. R. Messinger, Head, Statistical Division, *Workmen's Compensation Fund, West Virginia;* O. M. Olsen, Presiding Judge, *Nebraska Workmen's Compensation Board;* William H. Chestnut, Secretary of Labor and Industry, *Harrisburg, Pa.;* T. L. Hughes, *Industrial Commission of Minnesota;* E. Espenshade, Chief, *Division of Statistics and Research, Illinois Department of Labor;* James H. Flucker, Superintendent, *Industrial Commission of Ohio;* Ivanell Burns, *Statistical Division, Michigan Workmen's Compensation Board and State Industrial Accident Commission;* and Joseph A. Haller, *Director of Safety, Maryland.*

WHAT DOES THIS MEAN?

1

THE TWO charts on the left prove beyond doubt that, numerically, foot and toe injuries play an important part in the overall industrial accident picture. These figures mean that the men making up top management should personally take steps to crack down on this type of accident. Safety supervisors and their safety engineers should put their collective shoulders to the wheel by supplying statistics, facts and figures to top management and by going out among the workers preaching safe practice and safety shoes.

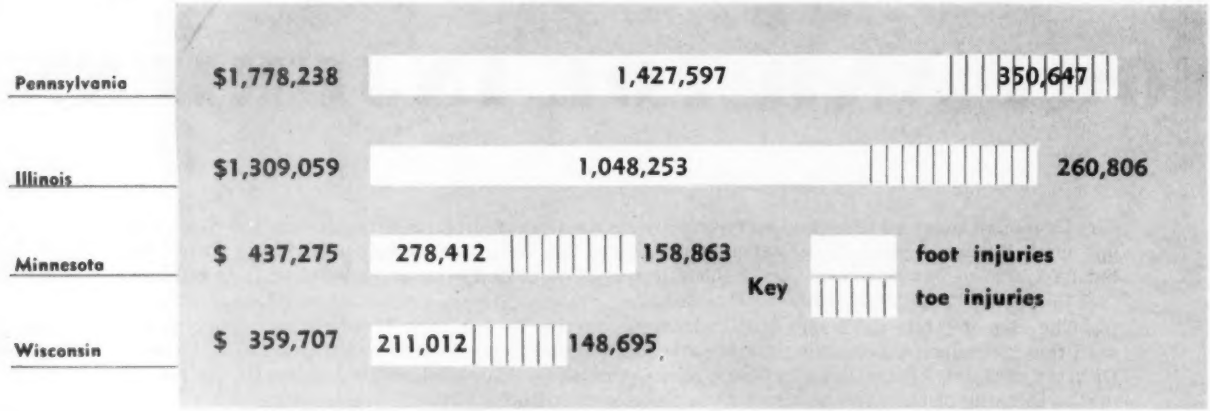
Considerable publicity is given to the hazards of railroad crossings. Yet, during 1947 only 4,117 persons in the entire country were injured near the familiar "Stop—Look—Listen" signs. (1948 Edition Accident Facts) *During the same period, in Ohio alone, over 26,000 workers suffered foot and toe injuries.* It is unfortunate that foot and toe injuries do not receive the same amount of attention, publicity-wise, as do so many other kinds of accidents of more spectacular nature.

In spite of the lack of publicity given foot and toe injuries many plants not previously concerned are now going all out to put a stop to them. As will be shown on the following pages, this type of accident is extremely costly to the employer.

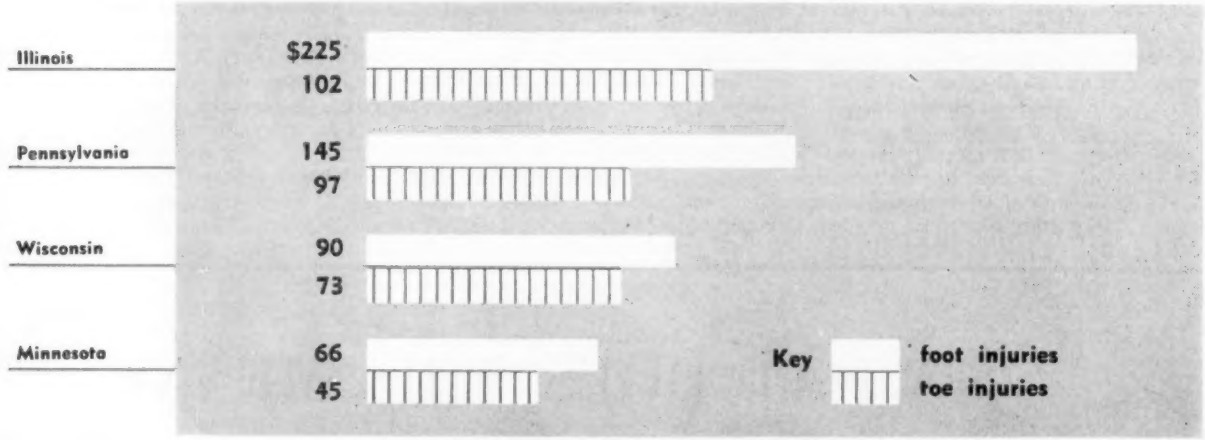
A tabulation of ten state labor department reports revealed that out of approximately two million disabling injuries, 182,000 (about 9%) were foot injuries and that 97,000 (about 5%) were toe injuries. In those ten states foot and toe injuries comprised 14% of all disabling injuries. The percentage of foot injuries as compared with toe injuries varies considerably from plant to plant. One large fabricator of steel products discovered that there were more toe injuries than foot injuries. This same company also found that there was more time lost and more money spent for the cases classified as toe injuries.

(Survey Continued On Next Page)

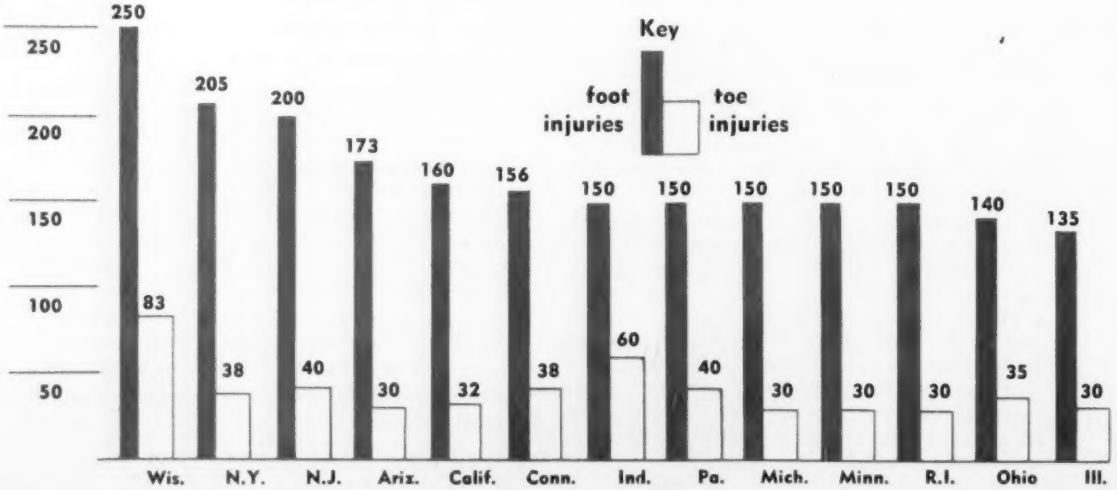
2 *Now, let's look at the money involved. How much is paid out annually by various states for foot and toe injuries?*



3 *What does this boil down to—insofar as average cost per individual foot or toe injury case?*



4 *What does the law have to say about the number of weeks compensation must be paid for foot and toe injuries in various states?*



WHAT DOES THIS MEAN?

2

FIGURES like these mean, first of all, that industry is paying a large sum of money for a "luxury" it can ill afford. The figures given in this chart indicate actual dollars spent only for compensation and do not include the host of other direct and indirect costs borne by industry for such items as time lost, immediate first aid, hospital and doctor's care. Indirect costs alone have been reliably estimated to double the cost shown in this chart.

A good many states do not keep records showing how much money is spent for paying off foot and toe injuries—another reason why this insidious expense to industry has been allowed to assume such large proportions without attracting any considerable amount of attention.

Figures in this chart show that each and every industrial plant should look to their own records and smoke out the cost of foot and toe injuries. Once this is done—half the battle is won. Once top management is made aware of the dollars and cents these injuries are costing—then preventive measures are more likely to be taken. The brunt of the job, at first, rests in the hands of safety directors and engineers. With a reasonable amount of cooperation, they can dig into company cost records where necessary to complete their own safety department records. After these figures have been assembled and substantiated they should be turned over to the upper echelons of top management. Once the cost is proven, safety directors should have less trouble in establishing concrete preventive measures such as a sound safety shoe program.

3

READERS will note that the highest figures given in this chart are for the State of Illinois. The figures are $225 for foot injuries and $102 for toe injuries. The figures shown here are from state records, and though substantial enough, run much lower than the figures supplied us by many industrial plants. In Wisconsin, for instance, an amputation case involving one toe cost $1,877 and 330 lost days while another amputation involving two toes cost $2,919 and 900 lost days. Individual reports from Pennsylvania indicated sixty-six amputations at an average cost of over $800 each.

The A. O. Smith Corporation in Milwaukee discovered that their average cost per foot and toe injury case (toe injuries running higher) was over $62.00—yet a single amputation case cost $286.27 and 300 lost days. Of interest in this case was the notation sent us reading, in part, "safety shoes would certainly have prevented the injury from being as serious and quite probably would have avoided any amputation."

In labor department reports covering 10 states, it was found that the average cost of foot injuries ran $264, while toe injuries cost $149.00 each.

From these figures it is apparent that the average costs of foot and toe injuries vary considerably according to individual circumstances. One fact remains, however. They all cost good money and they all cost a great deal more than the pair of safety shoes would have cost that could have, in most cases, prevented the injury.

These figures mean that no plant can afford to ignore the foot and toe injury problem. These figures prove that indeed "an ounce of prevention is worth a pound of cure." Many plants, both large and small, have found to their sorrow that a single severe toe injury costs more money than an entire safety shoe program—a program that would have protected all of their employees from injuries both severe and minor.

4

THIS CHART shows number of weeks for which compensation is payable for specified injuries in typical states. The figures shown are for loss or loss of use of the foot or great toe. Compensation for other toes is approximately one-third that of the great toe.

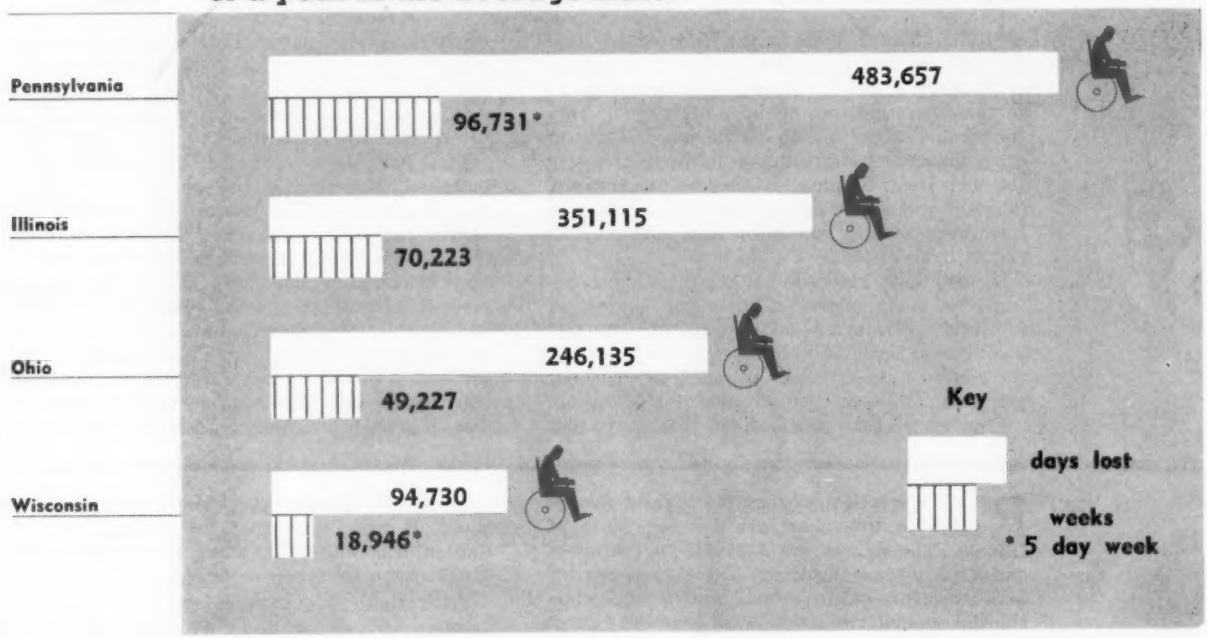
These figures were chosen to prove what will happen, compensation-wise, should an employee suffer a severe foot or toe injury. If management takes the grim view—*that the worst might happen*—then it can protect itself against the majority of all foot and toe injuries. Fortunately for all concerned with this problem, a pair of relatively inexpensive safety shoes will go a long way in preventing serious toe injuries as indicated in chart 4.

In the state of Ohio compensation for loss or loss of use of the great toe may be paid for thirty weeks. Weekly compensation now runs $30.00 in that state, so such an injury could cost $900 in compensation payments alone. This figure does not include medical treatments and other direct and indirect cost which about double the compensation costs. In a great number of cases where the great toe is lost, one or more additional toes are involved. In Ohio this means ten weeks additional compensation for each toe involved other than the great toe. It can be easily seen that a moderately severe foot injury involving the loss of the great and one other toe could cost $1,200 in compensation alone—an estimated $2,400 after other costs—and all for the want of a safety shoe costing six or seven dollars!

(Survey Continued On Next Page)

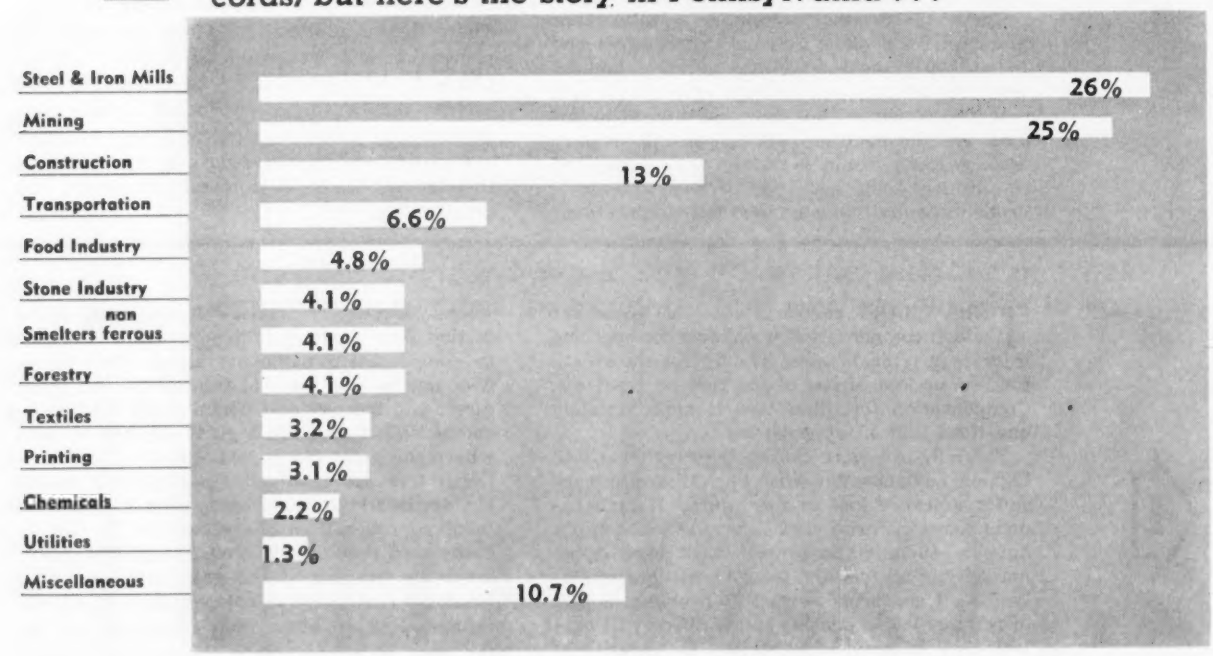
5

Lost time means headaches to any production manager or safety director. Just how much time is lost during the course of a year in the average state?



6

How about Industry's classification? Where are most foot and toe injuries suffered? Many states don't keep such records, but here's the story in Pennsylvania . . .



WHAT DOES THIS MEAN?

5

WE HAVE seen how much money foot and toe injuries cost management in compensation payments through increased insurance rates, etc. We have also intimated that compensation payments only make up about one-half of the total sum of money these injuries cost. There are many other direct and indirect costs connected with these injuries that must be considered in the overall picture. Chart five gives us the story on one such indirect cost—Lost Time.

In the State of Illinois alone, foot and toe injuries accounted for over 350,000 man-days lost. Figuring five days to the week, that means over 70,000 weeks lost. It is impossible to compute the exact amount of dollars and cents lost to industry because of time lost resulting from these accidents, but it has been estimated many times that all such indirect costs about double the compensation cost involved for each such injury. Certainly, lost time plays an important part in this total! Interruptions to production schedules are costly—and 350,000 lost man-days can play considerable havoc to a lot of production lines! Every person who is familiar with industrial shops knows how a single accident can disrupt the entire shop routine for an hour or more. When a worker loses his toe to a chunk of dropped casting, his scream of agony brings everyone within hearing to his side. This is only human nature, yet is another indirect cost certainly to be reckoned with. Added to this is the expense of breaking in a new man to take the place of the injured one.

Average days lost per foot and toe injury case varies with circumstances. A tabulation of all answers to the OH survey disclosed that about 17½ days were lost per case. This however does not include any of the many amputation cases recorded during the survey. Days lost in these cases ran anywhere from 300 to 900.

6

VIRTUALLY ALL of industry is exposed to the foot and toe injury hazard. In spite of the fact that many states do not keep records in such detail, a compilation of the existing state records, together with U. S. Labor Department records, disclose the fact that all segments of industry come in for their share of these injuries.

The OH survey on industrial foot and toe injuries disclosed that all of the so-called "non-hazardous" industries (those industries other than iron and steel mills, foundries, mines, railroad shops, etc.) suffered a large number of such injuries.

It is true that management of iron and steel mills, mines and construction industries must be especially alert to the foot and toe injury problem. It is these industries that carry the brunt of the damage. However, the remaining numbers of such injuries, divided among the less hazardous industries are still of more than sufficient numbers to cause real concern among this latter management group. Approximately 45% of all the foot and toe injuries suffered each year happen in such places as printing plants, textile plants, chemical manufacturing plants, slaughter houses, canning industries and a host of other establishments where the foot and toe injury problem was not thought to be serious.

The primary reason for this survey is to emphasize that fact that *everyone* must be made aware of the seriousness of the foot and toe injury problem. The survey definitely proved that all of industry, regardless of classification, is paying far more than they should for this type of accident.

HOW TO SELL SAFETY SHOES TO WORKERS?

THE FOREGOING survey makes it obvious that industry needs concern itself with outfitting workers with safety shoes. How should this be done?

There are several tried and proven methods of making safety shoes available to employees of industrial plants. Regardless of the method, however, one important factor applies. *It is imperative that some plan of payroll deduction be established if the program is to work.* It is not an absolute necessity that management help pay the cost of safety shoes for their workers—but such a policy certainly helps to get protection on the feet of all workers. Whether the company provides financial backing or not, a payroll deduction plan should by all means be set up so that it will be easier for the average plant worker to buy safety shoes.

The most successful method of selling safety shoes to workers is the establishment of a shoe store within the plant. All manufacturers of safety shoes will gladly cooperate with the plant in setting up such a store. These manufacturers select a complete stock of shoes designed to meet the needs of the plant. They will spend the needed time training a member of the plant (usually the storekeeper or someone from the safety department) in the fitting of shoes. These reputable manufacturers will follow up with frequent calls to adjust complaints,

(CONTINUED TO PAGE 38)

The life and times of Careless Cal

Portrait of the Author

(CHAPTER 6) Courtesy Southwest Airmotive Co.

(By Al Hartung Relations Director, Southwest Airmotive Co. Cartoonist, William Harper.)

DO YOU *Rattle* WHEN YOU RUMBA?

or

Had You Rather Be A Musclemoose?

If you are bored with boards — or, for that matter, with boxes, engines, fat women or Sherman tanks, — don't be a foppydopp and pick them up a few at a time.

Be a musclemoose and pick them all put at once. This makes your gizzard, goozle and thromboolaplex shimmy, shake and sometimes pop with all of the luscious snap of an over-ripe banjo string.

Doctors lead dull lives, generally speaking. Why not confuse and amuse them with the most completely mixed-up insides they've ever seen? When they go into your stummick they won't be able to tell the blood vessels from the differential without a program. As they pick carefully through the maze of twisted-up plumbing, new and exciting horizons will be opened to them. They'll love you for making all this possible.

Besides, if you over-lift sufficiently, you'll get to go through the rest of your years wearing a sporty contraption around your waist which combines all of the comfort of cast-iron ear muffs with the fashionable appearance of a polka dot Paris girdle. When the boys at the club see what you've got that they ain't, they'll be positively mauve with envy.

CLOUDING THE *Tissue*

or

Operation Crosseyes

This is why I am sometimes referred to as a Big Squirt.

I call this particular treatment the Little Gem Handy Dandy All-Purpose Smoke Screen Procedure. Why? Well, for instance, if you are in an argument and coming out second best, you can squirt a cleaning compound into your mouth and thus be able to make stinging statements. Also, if you want to stick your tongue out at the shop foreman, you can hide yourself in a cloud of Turco, make a nasty face unseen by the boss, and then emerge from the mists, smiling and looking most congenial, indeed.

This Procedure enables you to resort to other clever subterfuges, such as dissolving off your hair in order to resemble another person when the wife is looking for you with a skillet in her hand, and melting away fatty tissue under your chin to improve your general appearance.

Finally, getting acids and cleaning compounds into your eyes permits you to work at a blinding rate of speed. So blinding, in fact, that you can't see a thing you're doing — maybe for the rest of your life.

NO DANGER TO EYES!

—with CESCO PROTECTION

CESCO's new 545 cup-type goggles feature Comfort-King headband —which holds goggles firmly with 30% less tension. Available in models for welding, chipping, acid handling and where dust protection is required.

CESCO Face Shields assure complete frontal protection and all-essential comfort necessary for continuous wear. In wide range of plastic window sizes with open top or deflector crown.

• You assure your workers maximum eye protection with quality-tested CESCO Goggles and Face Shields. Your workers assure you they will be protected because CESCO Goggles and Face Shields are easy and comfortable to wear. CESCO protection and comfort means your work-stoppage is reduced to a minimum—an important factor in today's production.

CESCO protective equipment is used in plants where safety standards are the highest. That's a recommendation to you.

***YOU** can improve safety conditions in your plant by reading CESCO's new 64-page publication—"Where to Use, How to Use and How to Select Industrial Protective Equipment." Write for your copy today!*

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CESCO FOR SAFETY

CESCO

OFFICES IN: Boston, Buffalo, Cincinnati, Cleveland, Columbus, Dallas, Detroit, East Orange, Houston, Los Angeles, Montreal, Philadelphia, Pittsburgh, Seattle, St. Louis, St. Paul, Toledo, Tulsa

CAN ASPHYXIA STRIKE WORKERS IN YOUR PLANT?

Crushing accidents . . . severe electrical shock . . . heart attacks . . . heat suffocation . . . monoxide poisoning . . . smoke suffocation . . . drowning . . . and other forms of asphyxia can strike down workers in your plant no matter what you make. Industrial experience has shown that accidents involving asphyxiation can occur despite the most carefully laid safety precautions. And when a worker stops breathing, time and death will not wait for haphazard rescue efforts.

SAVE WORKERS LIVES COMBAT DISABILITY with an E & J RESUSCITATOR

YOU HAVE A RESPONSIBILITY to protect your workers from asphyxial hazards, to prevent loss of man-hours, and to minimize company liability for death or injury.

YOUR BEST PROTECTION when asphyxia strikes is the automatic resuscitation action of an E & J Resuscitator. This life-saving instrument breathes for those who are unable to breathe for themselves. Through a face mask it introduces oxygen into the victim's lungs and exhales for him. Because it automatically adjusts itself to lung capacity, the E & J Resuscitator is as safe for a baby as it is for your strongest worker. It is light and durable . . . one person can carry . . . operates on its own oxygen power . . . is easy to use. See for yourself why this safe, efficient instrument is considered essential equipment by industries, rescue squads and hospitals the country over. Send coupon below or write for a demonstration. There is no obligation to buy but you owe it to your company to see the resuscitator in action.

E&J *The Breath of Life*
...RESUSCITATOR-ASPIRATOR-INHALATOR

E & J MANUFACTURING CO.
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☐ Please arrange an E & J Demonstration.
☐ Please send complete E & J literature.
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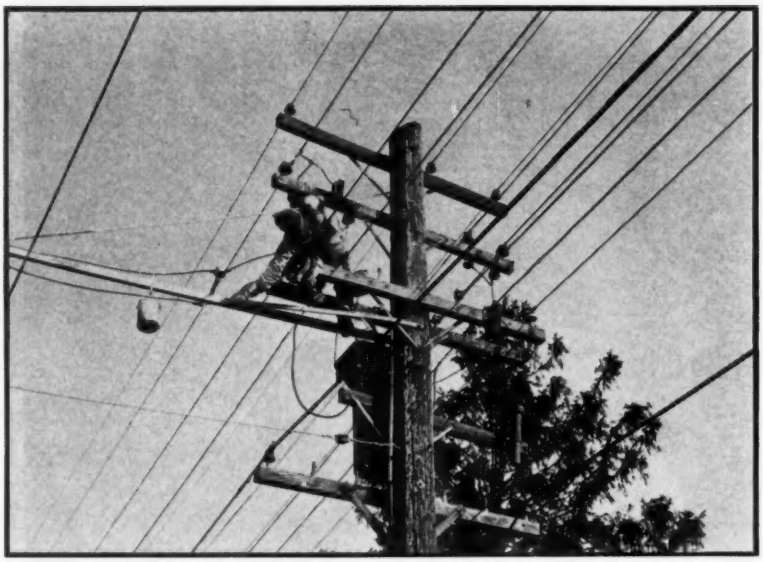
title .....
firm .....
address .....

JOURNEY'S END



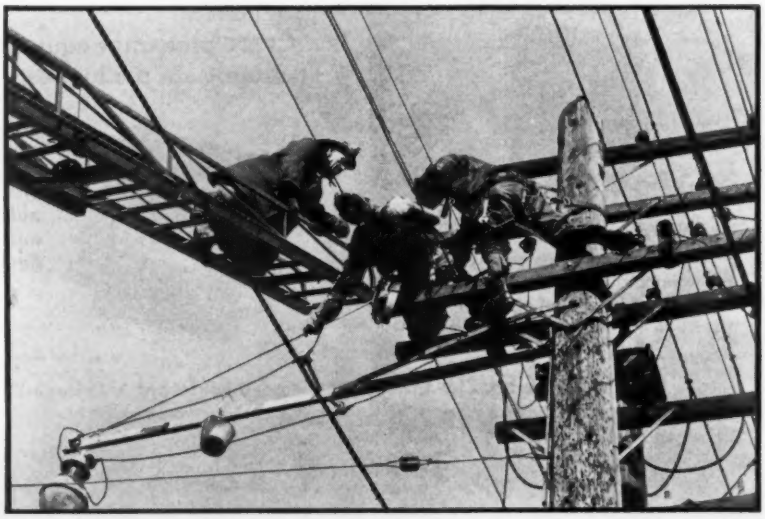
1 With only his paint bucket for company, maintenance man meets death on a power line.

Camera Records Tragedy

Death by electrocution is not a fate reserved exclusively for murderous criminals. Unhappily, many stalwart citizens of our land meet the same fate—atop utility poles.

During a recent two-month period OH received 86 news clippings describing fatal accidents suffered by linemen, plant electricians and plant maintenance men. The majority of these accidents were caused by failure to wear proper protective clothing—mostly protective gloves. Many linemen, however, met their deaths by grabbing for hot lines in an attempt to break a fall. Others brushed against energized lines while working on de-energized ones. For example, one lineman reached into his shirt pocket for a cigarette. His elbow touched the 20,000 volt line that killed him.

Plant maintenance men frequently get into trouble when working in and around live equipment. Most of these accidents result when materials they are carrying come in contact with loaded wires. Many get killed while cleaning or painting around energized power lines. For a glimpse at how one such painter met death—see pictures.



2 Unhappy fireman stands by on aerial ladder to assist properly garbed professional lineman in lowering electrocuted worker. (TURN TO PAGE 21)

NOW - Nylon Eyecups

for Safety Goggles

Greater Comfort

Greater Vision

Greater Strength

Style L1

Nylon cups fitted with WILLSON-WELD* lenses for gas welding. Indirect ventilation reduces flash and glare hazard.

Style L2

Nylon cups fitted with WILLSON Super-Tough* lenses for chipping, snagging and other heavy duty operations. Cups are well ventilated to reduce fogging.

NEW CATALOG

In addition to product information, it contains information on safety glass, filter glass, respiratory hazards, etc., which will help you select proper safety equipment to meet specific hazards. Send for it!

For the protection of your workers' eyes—and *your* profits, WILLSON offers this new development in safety goggles. Eyecups of NYLON combine unusual strength with exceptionally wide vision. Yet they are lighter than other heavy duty goggles, contributing to comfort which is a must in getting safety equipment worn.

Extra wide vision is provided by the triangular lens shape, an exclusive WILLSON feature. The adjustable nose bridge and rolled edges of the eyecups assure good fit around the eyes while the adjustable elastic headband is adaptable to all head sizes.

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WILLSON

"Established 1870"

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Falling HAZARD SIGNS

Even the sharpest eye cannot see thru an armload of boxes.

Look Out!

FALLING HAZARDS are major ones in Industry, often resulting in injury or death.

People fall over things carelessly left in the way; they fall down stairs; off ladders. Others are victims of objects falling on them from roofs, scaffolds, shelves . . . out of other people's hands.

STONEHOUSE SIGNS
For Accident Prevention

help prevent these accidents. Post Stonehouse Falling Hazard signs . . . especially designed and worded for this specific purpose.

Our Catalog No. 8, 64 pages, in full color, is free on request.

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MANUFACTURERS

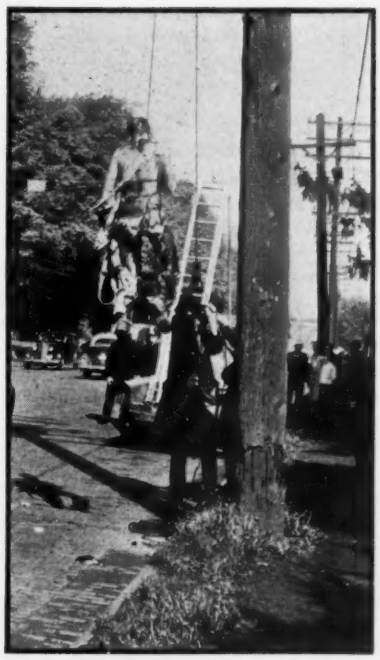
"Stonehouse Signs Since 1863"

ACCIDENT PREVENTION SIGNS IN STANDARD COLORS AND DESIGNS

JOURNEY'S END

(Continued from page 18)

3 Experienced lineman lowers unfortunate victim through maze of hot wires. Some of these lines carry 25,000 volts or more, reason enough why most linemen welcome the use of special safety tools and full line of protective wearing apparel and devices.



4 Onlookers gape as victim nears ground. Except for climbers and unused safety belt, this maintenance man was wearing none of the equipment usually worn by professional linemen. That, and lack of hot line experience, should prove warning to other plant maintenance men.

MICROTRIP...

the Safety Device that Aids Production 3 Ways:

1 GREATER OPERATOR SAFETY

2 LESS OPERATOR FATIGUE

3 INSTANT PRESS RESPONSE

MICROTRIP Control is a new two-hand electrical control for a wide variety of operating mechanisms on power-operated equipment.

It is a safety control that cannot be "cheated", as both hands must be out of the danger area before the control mechanism will operate.

A complete MICROTRIP Control installation consists of (1) two hand switches; (2) the MICROTRIP Control unit; and (3) a solenoid or solenoid valve and air cylinder to operate the clutch pin.

MICROTRIP safety control is easily installed on either old or new equipment. For full information on the application of MICROTRIP control to your power-operated equipment, write MICRO SWITCH, Freeport, Illinois, or to any branch office.

MICROTRIP control box and two plate-actuated MICRO precision switches.

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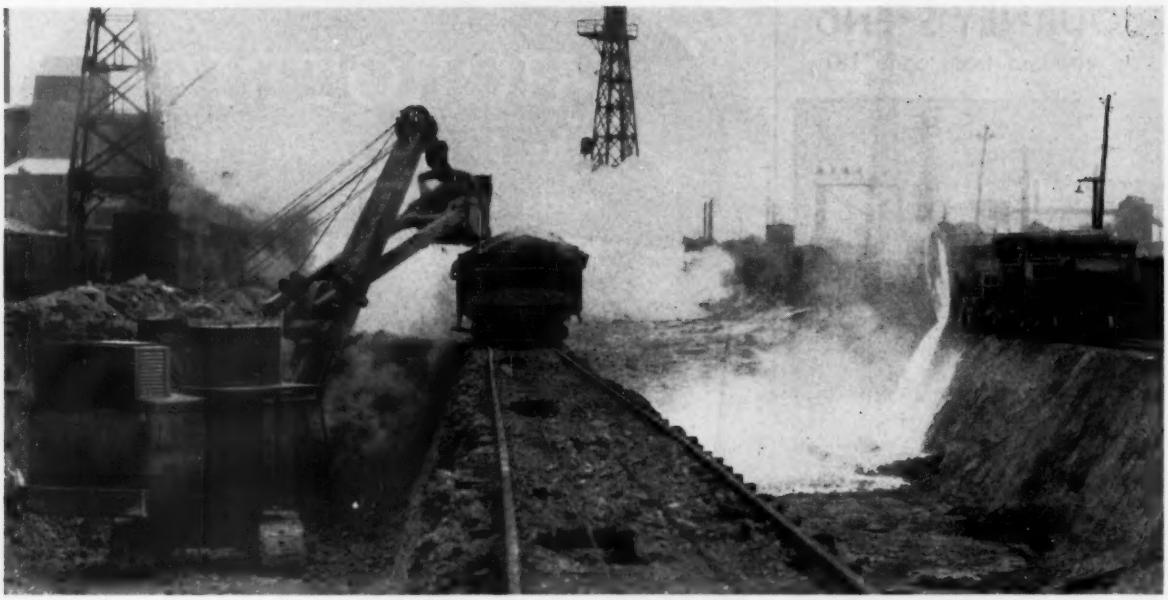

Molten slag at a temperature of 2800 degrees is being poured into the pit from the ladle at the right.

MISTER — IT'S HOT OUTSIDE!

by
R. A. MERCK
Air Conditioning Engineer
Dravo Corporation

THE first practical unit for conditioning air in the cabs of cranes that handle hot metal was installed in the cab of a steel mill ladle crane shortly after the war. In the few years since then many installations have been made in steel plants, iron and steel foundries, and hot metal forging shops.

Keeping the air in a crane cab at 80° when the temperature in which the crane is working may be as high as 160° not only means more healthful working conditions for the operator, but contributes materially to safety. A fatigued crane operator is a hazard to all others in his part of the plant. Because these cooling units also remove all dust, dirt and noxious fumes from the air delivered to the cab, both the health and safety factors are increased.

Recently a new application for the air cooling and cleaning unit was found in the steel industry—conditioning the cab of a shovel handling slag. At some steel plants there are no nearby areas where the slag from the furnaces can be dumped for permanent disposal. In these cases, the molten slag is dumped temporarily into a pit near the mill, and permanently disposed of later. Often the removal is handled by a company that processes the slag for such products as building blocks, highway and other construction materials.

This practice is followed at the Pittsburgh Works of the Jones & Laughlin Steel Corporation on the banks of the Monongahela River. Virtually in the heart of the city, only a few blocks from the Golden Triangle, there is no area within many miles that would be suitable for permanent disposal of the slag daily from the blast furnaces. The Duquesne Slag Products Company removes this slag from the temporary pit and processes it for building blocks, highway surfacing materials, and other products.

The pit consists of two parallel trenches, 15 feet deep, 30 feet wide at the bottom, and 600 feet long, that are connected at each end. The molten slag from the blast furnaces is hauled to the pit in slag ladle cars that

(Please turn to page 47)

This study is about how air conditioning was used to correct particularly bad working conditions in handling hot slag from steel mills. The same idea can be adapted wherever heat and noxious fumes make working conditions both uncomfortable and unhealthful.

Creative Craftsmanship

FIGURED SILVER DISH
Sassanian Era
226-641 A.D.
Hermitage Museum

"Counted among the foremost treasures of figured metal in all the world . . . this repoussé" silver masterpiece captures the brilliant and luxurious culture of ancient Persia and manifests all the vigor, color and rhythm of true Sassanian craftsmanship.

Probably it is true that not for honor alone did this ancient artist labor. Like all creative craftsmen who exert inexhaustible patience and tireless effort, his one desire may have been to attain an excellence, a superiority, that approached perfection as closely as humanly possible.

It is this philosophy that has guided Pax for a full quarter century in developing superlative Pax Heavy Duty. Today no other granulated skin cleanser surpasses this outstanding product in quality, in safety and all the other factors that have made it a favorite among America's largest industries.

[1]World History of Art by Sheldon Cheney

What is the PRODUCT USE FACTOR of PAX?

PAX

PAX-LANO-SAV HEAVY DUTY
GRANULATED SKIN CLEANSER

PAX-LANO-SAV*—a superior skin emollient combining lanolin and other special skin normalizers.

The Pax trademark symbolizes a deep-rooted tradition of superlative quality maintained through almost a quarter century of continuous research and development.

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Manufacturers of Fine Industrial Skin Cleansers

*Tradename of G. H. Packwood Mfg. Co.

In addition to PAX-LANO-SAV HEAVY DUTY, PAX also offers the following powdered or granulated quality skin cleansers: PAX CORN-TEX • PAX HYSPEED • DICTATOR SPECIAL PURPOSE • BORAPAX • SUPER-X • VELVAPAX LIGHT DUTY • OFFICE-PAX • PAX MECHANICS. Also available are PAX WATERLESS and PAX HECTO INK CLEANSING CREAM • PAX SKIN CLEANSER ECONOMIZER DISPENSERS • and many other fine PAX Products. 49L

How Many Accident Prones Here?

B. F. GOODRICH LOOKS AT ACCIDENT PRONENESS

By
G. A. BALZERSEN, Manager
Safety and Training
B. F. Goodrich Chemical Company
Louisville, Ky.

WEBSTER defines *proneness* as "having a tendency or inclination." Industry has long suspected certain individuals of being "accident prone" — or having a tendency to get into accidents much more frequently than their fellow employees. These individuals, though not exposed to any more hazards than their fellow workers, still manage to get themselves into a lot more trouble and do it a lot more consistently.

For years a controversy has raged among accident prevention and insurance people about this important subject. Some have taken the stand that as most accidents result from improper and incorrect acts or habits in doing things, then accident expectancy is relative only to training, experience and "right habits" developed in the individual. These "experts" maintain that accident prevention is largely a matter of training to cultivate correct work habits and that any normal person can become a safe workman if properly trained for the job. In other words—there just isn't such a thing as being "accident prone."

Many persons of responsibility, however, lean to that school of thought that maintains that fundamentally the personal characteristics and traits of individuals make them more liable, or less liable as the case may be, to accidental injury regardless of age, skill, or experience in their work. They believe some of these charactertistics to be inherent and deep-seated to the point where they are well-nigh impossible to correct.

We in the Safety Department of the B. F. Goodrich Chemical Company in Louisville, Ky., made a careful study of all published reports on this subject and then decided to conduct a series of studies in our own plant to find out first-hand just what the story was on this important question with respect to our own employees.

During the two year period beginning July 1st, 1947 and ending June 30th, 1949, a careful record was kept of the reported accidents sustained by two selected groups of hourly employees. A hundred employees were selected from the plant as a whole, the number from each department varying according to the size of the department. The departmental groups were taken from the top of the seniority lists. At the end of the first year the fifty men who had the least number of reported accidents were placed in the "good" or A Group and the fifty that had the most accidents in the "bad" or B Group. During the second year, due to separations or transfers, the groups were reduced to forty each. When these separations or transfers occurred the "opposite number" was removed from the list at the same time; however, the individuals remained in the same group regardless of their second year's accident experience.

Admittedly the sampling was small, however, it represented about 20% of our hourly paid work force during the periods.

Results of Study

Some interesting results were noted, as shown in the

(Please turn to page 46)

MAJOR CAUSES OF ELEVATOR ACCIDENTS

by
George H. Reppert
Safety Engineer
Otis Elevator Company

IMPROPERLY guarded hoistway and car entrances were the greatest cause of accidents in connection with elevators during 1948. This is shown by an analysis of 287 mishaps that occurred with all makes and types of elevators which has just been completed by the Otis Elevator Company.

Of this number, 161 were serious or fatal, and 67.1% of these could have been prevented if the elevators involved had been equipped with adequate safety devices or safeguards which are available and which are required for new elevator installations by all modern elevator codes.

Both freight and passenger elevators were included in the study, the third of its kind made since 1946. The analysis showed that 62 serious and 31 fatal accidents occurred with freight elevators; 49 serious and 19 fatal with passenger elevators. The remaining 126 mishaps—88 with passenger elevators and 38 with freight elevators—were classified as minor, involving only shock or bruises. The serious classification included broken bones, serious cuts, amputations and concussions.

Falls Down Hoistways Most Prevalent Cause

Most prevalent cause of serious and fatal accidents was that people continued to open hoistway doors and fall down elevator shafts when no cars were at the landings. Of all 161 serious and fatal accidents, 33.5% occurred in this manner. Twenty-three of the 70 accidents involving falls down hoistways where doors had been opened, including 17 serious and 3 fatal, were the result of persons opening hoistway doors with old-style emergency keys, coat hangers or similar devices.

32.3% Occurred at Car Entrances

A total of 32.3% of all serious and fatal accidents covered in the Otis analysis occurred at freight and passenger elevator car entrances.

Lack of car gates and gate contacts caused 45, or 48%, of the 93 accidents reported at car entrances. Nine, or 56.3% of the 16 serious and fatal accidents at passenger car entrances were due to lack of car gates and/or gate contacts. Thirty-three of the 51 mishaps at freight elevator car entrances resulted from the same cause.

Freight Elevator Safety Especially Important

"Since the percentage of serious and fatal accidents at the car entrance on freight elevators is much higher than on passenger elevators," the Otis analysis states, "this indicates that increasing the safety at the car entrance is particularly important on freight elevators."

An indication of what happens when such protective devices are lacking was the case of a 10-year-old boy who was killed. He was lying on a freight elevator platform with his head over the edge and was caught between the car and hoistway when his playmate started the old-style hand rope operated elevator. In another case a person was killed when trying to jump onto a moving elevator which had no car gate or gate contact.

Of the 82 other hoistway entrance accidents, 50 were minor, most of them being caused by tripping while entering or leaving the elevator or being struck by power operated horizontal slide car or hoistway doors.

22% Preventable by Safeguards

Twenty-two per cent of all accidents in that category could have been avoided had the car and/or hoistway doors or gates been provided with adequate locks and contacts.

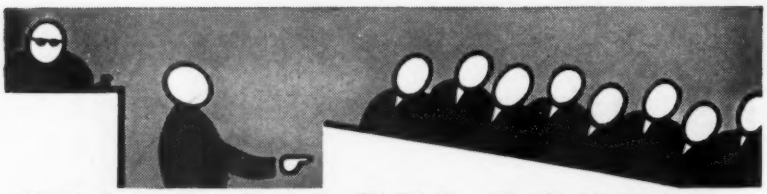
Not all of the accidents at elevator entrances involved persons using the elevator. In one case, a man who was fighting in the street fell 30 feet into the elevator pit and was killed. This freight elevator had no hoistway gate at the street level, the only protection being a chain stretched across the opening. In another case, a workman was seriously injured when he drove a power industrial truck through an elevator entrance door when the car was at an upper floor.

Few Mishaps on Automatic Elevators

Of all the reported elevator accidents, only 10.7% occurred in connection with automatic elevators and

(Please turn to page 46)

This report proves that the greatest reduction in elevator accidents can be secured by properly guarding the hoistway and car entrances.



RIGHT OFF THE DOCKET

Salesman On Road Attacked By Stranger

THORNTON'S employment necessitated travel by him from one job in town to another job in town. On the occasion in question, he was traveling from Norris to Knoxville where he was to do certain work. The lunch hour arrived during the course of his journey, so he stopped at a restaurant of his choice along the way. While he was seated at a table in this restaurant, awaiting the food which he had ordered, a stranger who was insane or drunk or "otherwise irresponsible" made an entirely unexpected, unprovoked and violent attack upon him, and inflicted the injury for which he here seeks Workmen's Compensation.

Thornton, of course, would not have been in that particular restaurant on this occasion if he had not been traveling for the purpose of performing duties of his employment. This, however, is not sufficient. The injury must arise out of the employment as well as in the course of employment.

Thornton's situation did not subject him to any more or different risk from that of any other member of the public who happened to be in this restaurant at the time. The fact is that a man who was either crazy, or drunk or otherwise irresponsible, just happened to select Thornton from those present as the person upon whom he would make the assault. He did not know Thornton and was not aware that Thornton worked for R. C. A. or what the nature of his business was, and did not care. There was no causal connection between the nature of Thornton's employment and this assault.

Although the act is liberally construed, to hold that this assault upon Thornton was compensable would seem to amount to a subjection of the employer to unrestricted hazard, a result not intended by the Workmen's Compensation Act. Thornton sought to draw a distinction between an assault made by a mentally irresponsible person and one by a person mentally responsible. The mental condition of the assailant has nothing to do with the presence or absence of causal connection between the employment and the assault. The distinction is irrelevant. To recognize such distinction would amount to nothing less than subjecting employers to the role of insurers against all accidents to employees which might occur in the course of employment.

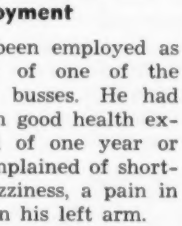
Since the assault did not arise out of Thornton's employment, it was not compensable.

Thornton vs. R. C. A. Service Co., Supreme Ct. of Tenn. July 2, 1949, 221 S. W., Second Series, Page 954

Impenetrable Fog An Unusual Hazard of Employment

McNEES had been employed as an operator of one of the company's trolley busses. He had apparently been in good health except for a period of one year or more when he complained of shortness of breath, dizziness, a pain in his chest and down his left arm.

At the time of his death, he was driving a hard to steer trolley bus. Death occurred on the night of January 17, 1947, shortly after 11:00 P.M., while McNees was inbound. The night was so foggy that no one could see more than two or three feet ahead. He was stricken while at the steering wheel of the bus and died within a few minutes thereafter of a coronary thrombosis, an aggravation of a pre-existing heart condition, which was caused by increased physical stress and strain, together with the increased mental stress and strain incident to being required to operate his bus under the unusual and extraordinary working conditions of an impenetrable fog, creating an unusual hazard of employment at a particular time and place.



His injury was held to be compensable within the meaning of the Workmen's Compensation Act. Statute presently provides for payment in the event of injury caused by mental strain and excitement alone which is produced in the course of and arises out of the employment. Although it has been consistently held that a compensable injury under the Workmen's Compensation Act must be accidental and traumatic in character, the Court took the further position that all accidental injuries having the essential elements of a compensable injury are compensable whether they are the result of accidental means or the result of a mishap which proximately caused the harm or damage.

Decedent's death was the result of a sudden mishap occurring by chance, unexpectedly and not in the usual course of events at a particular time and place, and, therefore, compensable under the law. By the accident of weather, he was exposed to a hazard greater than the general public, who were not required to drive a cumbersome vehicle on the public streets, carrying passengers for hire, with the consequential responsibility for their safety. Driving conditions forced upon the decedent an unusual manner of performing his work and quite out of the ordinary in seeking directions from a passenger located on the step of the opened door, and complicated as it incidentally was by counter instructions, these facts presented an unusual or out of the ordinary situation in the manner of doing his work which he was forced to undergo or undergoes voluntarily.

Clearly, there was increased physical strain in peering into the blanket of fog, straining to keep on the course. All of these facts seem to supply the causal connection between the employment and the mishap, in the light of medical testimony to the effect that the blood pressure could be increased thereby. McNees vs. Cincinnati Street RR Co., 84 Ohio Appellate, Page 499.

"Proximity Rule"

CLAIMANT was an employee of the corporation whose business was of a hazardous nature. The corporation's plant was located about three miles west of Lake Charles, on the south side of U. S. highway 90. The claimant resided approximately 80 miles from Lake Charles. He had no means of conveyance of

his own and the employer did not furnish his transportation. Like many other employees, he went to work each morning on a bus or public conveyance. Claimant would leave his home town about 4:40 or 5:00 A.M. so that he could go to work, which began approximately 7:30 A.M.

Employees going to work had to use a gate which was located about in the center of the plant property, along highway 90 which is designated as the entrance gate. A watchman was stationed at the guard house next to the gate and each employee entering had to exhibit his badge in order to be identified before being permitted to enter the premises.

As usual on March 30, 1948, claimant boarded the bus at his home town in order to reach work at 7:30 and made the customary journey from that town to the plant, reaching there about 10 minutes before 7 o'clock. The bus, following its customary procedure, stopped opposite the entrance gate to the plant and discharged the claimant and some others who were likewise employed at the plant. On the south side of the highway, the corporation maintained a stopping point for busses, where they were allowed to park. There was no such landing area provided on the north side of the highway and it was necessary, therefore, for the claimant to cross the highway in order to go from the north side to the south side where the entrance of the plant was located.

While the claimant was in the act of traversing the highway after having left the bus, he was struck by an automobile driven by a stranger, traveling in an easterly direction and suffered the injuries which have permanently and totally disabled him.

Two factors present itself—one, the proximity of the public passageway and its necessity and convenience for the conduct of the employer's business, and two, the relation which the time of the accident bears to the time at which the employee was to assume his duties—are very important elements that have to be taken into consideration.

All the employees were instructed to use the gate adjacent to the highway, for means of ingress and egress. The highway afforded the only way of travel by which the employees reached the plant and

NEW!

C-O-TWO

DRY CHEMICAL TYPE
FIRE EXTINGUISHER

EXCLUSIVE DESIGN
assures you of fast, positive fire protection

SELF-CONTAINED UNIT . . . rugged construction . . . no extra gadgets protruding or complicated operating parts . . . one of the most efficient, foolproof, easy-to-use fire extinguishers known . . . two convenient sizes, 20 pound capacity and 30 pound capacity.

C-O-TWO DRY CHEMICAL STAYS FREE FLOWING . . . no syphon tubes or valves within the cylinder to become clogged or inoperative . . . discharge hose and squeeze type discharge nozzle remain empty until the fire extinguisher is actuated. Inverting the fire extinguisher before using provides mechanical breakage by changing the position of the dry chemical in the cylinder. Bumping to actuate the fire extinguisher provides additional mechanical breakage as well as continuous carbon dioxide gas pressured agitation or fluffing of the dry chemical. These combined features plus a skillfully blended free flowing extinguishing agent assure you of a faster, more effective and complete discharge.

APPROVED . . . Underwriters' Laboratories, Inc. rating is B-1, C-1. C-O-TWO Dry Chemical is non-conducting, non-corrosive, non-abrasive, non-freezing and non-toxic . . . highly effective on flammable liquid and electrical fires.

RECHARGEABLE ON-THE-SCENE . . . no special tools needed . . . one piece removable top assembly leaves large unobstructed opening in the top of cylinder for refilling. C-O-TWO Dry Chemical for recharging is available in handy premeasured moisture proof containers.

Write today for complete free information on this new, quick-acting fire extinguisher . . . no obligation.

C-O-TWO FIRE EQUIPMENT COMPANY
NEWARK 1 • NEW JERSEY
Sales and Service in the Principal Cities of United States and Canada
AFFILIATED WITH PYRENE MANUFACTURING COMPANY

since they are a necessary and integral part of the operation of the plant, it is a logical deduction that as a means of reaching their place of employment, it becomes a necessary convenient passageway for the conduct of the employer's business; and this notwithstanding the fact that the public generally is subjected to the same hazards as are the employees who have to cross it regularly in going to and coming from work.

Where the employee, as in the instant matter, is living at a great distance from the place of employment and cannot choose his hour of departure from home and his hour of arrival at the plant, but has to depend upon the schedule of a public conveyance, it can be said that the time element plays as an important part in the instant case as it would in a case where the person furnishes his own means of transportation and has some choice in the matter.

Although the accident occurred 40 minutes before he ordinarily began the actual duties and services of his employment, this is of no consequence, as he would have to be where he was at the time the accident occurred in order to get to his place of employment within the time specified. He was not expected to remain on the north side of the highway and there wait until it was time for him to get to work. His employment contemplated his entry upon the premises, the same as it contemplated his working there and had to include a reasonable interval of time for that purpose.

Although it has generally been held that an injury sustained away from the employer's premises, while going to and returning from work is not compensable "as arising out of and in the course of employment", yet under the "proximity rule", an injured employee can recover compensation when he suffers a disability resulting from an accident sustained by him which occurs at a public crossing which is in such close proximity to the premises of the plant which he works as to constitute a necessary convenient passageway for the conduct of the employer's business, and may be said to be a part of the premises.

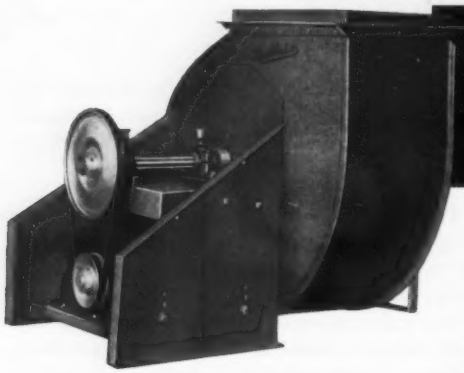
Guient vs. Matheson Chemical Corporation, Ct. of Appeals of La., First Circuit, June 30, 1949, 41 Southern Reporter, Second Series, Page 493.

Cab Manager Killed While In Restaurant Eating

THE decedent was by written contract, the assistant manager of the Cliff Cabs Company, under which he had the widest authority. His duties were to advance the business interests of his employer.

It was the practice, admitted by the employer, for Huston to take his meals while on duty and on the night of his injuries, he had with another employee, a driver, gotten into a cab of the Company and had driven to a Hull Dobbs Restaurant, where they were ordering food. As was the custom, the driver of the cab had turned over money of the Company to Huston, which he had in his possession at the time that he was killed.

While Huston and the driver were seated at the counter of the restaurant, a man entered and staged a hold-up. As the bandit was about to open a door, probably to leave the restaurant, Huston struck at but failed to hit him whereupon the bandit shot and



FOR FRESH, SAFE AIR
-Every Working Minute

"Buffalo" BELTED VENT SETS

Low-Cost, ADJUSTABLE Ventilation!

This light, non-overloading fan is low in first cost and operating cost—and its capacity can be altered AFTER installation simply by changing motor sheave, Also, because of its light weight, installation is simplified and less expensive.

Another popular feature of this fan is that it may be furnished with all-weather drive cover for outdoor installation. Available in capacities from 42 cfm. to 14,200 cfm. against ¼" static.

Lower insurance rates and low absentee records are no accidents where plant management looks into EVERY safety factor! PLANT AIR is today recognized as a real influence on health, safety and, of course, productivity . . . so why not be sure YOUR plant air is helping you EVERY WORKING MINUTE?

Your "Buffalo" engineering representative will be glad to show you how surprisingly inexpensive it is to install "Buffalo" Belted Vent Sets . . . and to enjoy the benefits of fresh-air circulation when you want it and where you want it. Call on him. It will be well worth your while.

BETTER WRITE FOR BULLETIN 3720 TODAY for complete information on these low-cost, versatile fans!

"Buffalo" FIRST FOR FANS

BUFFALO FORGE COMPANY

529 BROADWAY BUFFALO, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont. Branch offices in all Principal Cities

VENTILATING FORCED DRAFT | AIR WASHING COOLING | AIR TEMPERING HEATING | INDUCED DRAFT EXHAUSTING PRESSURE BLOWING

killed Huston, while his hands were in the air.

It can be inferred from his act that he meant to deter the bandit in his purpose to rob or bring about his detention and arrest. Huston's acts were unquestionably unwise, but it may be said that his injuries arose out of and in the course of his employment. The apprehension or defeat of the bandit was in the interest of those who were involved in the hold up. The money of the cab company was a part of the property to be protected. The mere fact that decedent had temporarily deviated from active operation of the cab of his employer does not prevent the determination that at the time that he was killed he was acting in the course of his employment.

The practice of Huston to go out with the drivers and participate in the activities of the company and to leave a cab in front of a restaurant and take a meal and then resume its occupancy, permits the conclusion that there was such connection between the employment and its activities as to support a finding that the decedent's injuries arose out of his employment.

It was sufficient to indicate causal connection of the injury and the employment through the activities, conditions and environments thereof.
Huston vs. Industrial Comm. of Ohio, Montg. County, Ct. of Appeals, April 7, 1949.

When Occupational Claim To Be Filed

CLAIMANT seeks recovery for disability resulting from chrome exposure. The company resists the claim on the theory that a disability occurred during period of coverage of policy issued by the Company because claimant continued his exposure to chrome after coverage of policy terminated. The disability claim due to chrome poisoning occurred during January, 1946, and the period of the company's coverage.

Company insists that if disability did occur during its policy coverage, the employee continued his exposure to chrome after its policy terminated and is barred from filing a claim until within one year from the last injurious exposure.

Court held that while the statute fixes the uttermost limit of delay in the filing of a compensation claim after the cessation of exposure, it sets no restriction or limitation, upon the filing before the claimant has ceased to be exposed.

The instant matter was not filed within one year of termination of coverage of policy. This did not barr claim for compensation for disability resulting from exposure.
Calabria vs. Liverty Mutual Ins. Co., et al, Superior Ct. of N. Y. Appelate Div., July 26, 1949, 68 Atlantic, Second Series, Page 283

For Information About

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SAFEET*

. . . the new, lightweight metatarsal arch guard. Protection against 20% of all lost time accidents in industry.

SAFEET, the newest development in the past 15 years. Designed to afford comfort and protection to the foot and metatarsal arch, when worn with regulation safety shoes. Potential impact distributed over two separated bearing surfaces. Primary load-bearing surface is an adjustable steel bar attached to the shoe heel by spring tension. Secondary surface is the steel toe cap incorporated in all standard safety shoes. On-the-job analyses, interviews and engineering "know-how" assure worker acceptance.

1. Entirely new protection when worn with steel toe capped safety shoes.
2. Perfectly balanced, SAFEET move with natural action of foot.
3. High fatigue strength means greater protection.
4. New comfort and new protection for foot and metatarsal arch.
5. Superior resistance to impact, abrasion and atmospheric corrosion.
6. Lightweight and self-adjusting, when sitting, standing, stooping, walking or running.
7. Highly resistant to potential impact from any angle.
8. Snaps on and off quickly and easily.
9. Made in four right and left sizes for shoe sizes from five to thirteen.

*T. M. Reg.

TRINAL INCORPORATED, 634 N. Orleans St., Chicago 10, Illinois

SPECIAL INDUSTRY SAFETY PROGRAM

This chart is a part of the special industry safety program of the Bureau of Labor Standards of the U. S. Department of Labor. Available to State labor departments upon request.

SAWS

TOOL BLADES — HANDLING MATERIALS — BELTS —

BAND SAW | RIP SAW | AUTOMATIC FEED RIP | CUTOFF SAWS

SURFACING MACHINES

HAZARDS: Tool Blades—Handling Materials—Moving Machine Parts

JOINTER | MOULDER | PLANER

ROUTING — BORING

HAZARDS: Handling Materials — Belts — Pulleys — Tool Blades

ROUTER | MORTISING | BORING

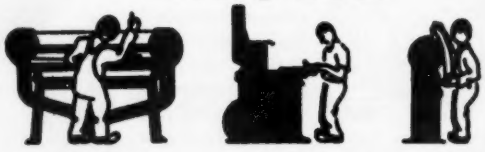
SANDING MACHINES

HAZARDS: Handling Materials—Rotating Parts

AUTOMATIC BELT SANDER | DISC SANDER | DRUM SANDER

SHAPING MACHINES

HAZARDS: Tool Blades — Rotating Parts — Belts, Pulleys — Handling Materials



TENONER | SHAPER | LATHE

PROCESS CHART SHOWING POSSIBLE HAZARD

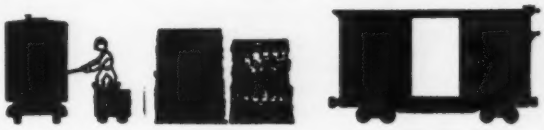
RELATED OPERATIONS

HAZARDS: Handling Materials — Hand Tools
Fumes

MAILING | ASSEMBLY | SPRAY PAINTING

RELATED OPERATIONS

HAZARDS: Handling Materials
Poor Piling



RECEIVING | YARD STORAGE | SHIPPING

PORTABLE ELECTRIC TOOLS

HAZARDS: Tool Blades — Rotating Parts—
Electric Shock

SCREW DRIVER | DRILL | SANDER

HAND TOOLS

HAZARDS: Tool Blades — Improper Use—
Storage

EVERYDAY HAND TOOLS

PLANT-WIDE HAZARDS

Fire
Explosion
Flying Objects
Belts - Pulleys
Gears - Shafts
Poor Housekeeping
Walking - Standing Conditions
Falls of Material
Electricity

HANDLING OPERATIONS

Hazards: Handling Materials — Poor Piling

HAND TRUCKS | CONVEYORS

INDUSTRIAL
Accidents in the News . . .

These accidents are taken from the pages of the nations Newspapers. They've all happened—they didn't have to!

Rock Hill, S. C. Herald:

One man was killed and another injured yesterday afternoon when a scaffold collapsed at the Celanese Corporation of America plant under construction on the Charlotte highway. W. M. Nolen, 46, died enroute to the York hospital, and J. B. White, 22, was still being treated at the hospital although his condition is said to be good. While the men were working on the second floor shortly after 2 p.m. the scaffold suddenly began collapsing. They were working about 39 feet from the ground.

Prevention:

Good material and good workmanship should go into the making of all scaffolds, regardless of the type scaffold. Too many scaffolds are made in a hurried, haphazard manner from inferior grade materials.

◆

Philadelphia, Pa., Bulletin:

A workman suffered fatal injuries at the Sun Shipbuilding and Dry Dock Co. plant in Chester when a heavy steel plate fell on him. Francisco Poliafico, 58, died in Chester hospital yesterday two hours after he was found by a fellow worker in the plant's scrap yard. Company officials said he had been burning in half a one-half inch thick steel plate. Doctors said he died of a crushed chest.

Prevention:

It is always a big joke when someone portrays a man sawing a tree limb while sitting at the end of it. Sadly enough, the same thing happens many times under only slightly different circumstances. Time after time one reads and sees the man with the torch cutting heavy metal with not the slightest thought as to where the cut piece will fall. Besides serious personal injuries, such practice is also a serious **fire hazard.** It only takes a moment for the cutter to visualize exactly where the piece he is cutting will fall and for him to take precautions that no one will get hurt, including himself.

◆

Weirton, W. Va., Times:

William Boyd, 57, was instantly killed while at work at the Weirton Steel Company. The fatal mishap occurred this morning at 10:07 in the 28-inch structural mill finishing department, where he was superintendent. He suffered a fractured skull when he was struck on the head by a crane hook. He was pronounced dead upon arrival at the Weirton Steel Emergency hospital.

Prevention:

Every crane operator should be fully versed in the rules of safety. The same holds true for his hookeron. Safe crane operation demands many safe working habits that probably could have prevented this accident. Some: The zone into which the crane hook was being lowered should have been cleared of all personnel by the ground man. The operator should have been in a position to see that all was not clear.

◆

Bloomington, Neb., Advocate:

Eddie Collins, a foreman with the Harlan Construction Co., is the first man to be killed on the Harlan County dam project. Death occurred Wednesday when Collins was crushed by a four car train containing buckets of cement. The Franklin man who was operating the engine *could not see the tracks in front because of the height of the buckets of cement.*

Prevention:

We put the last sentence of this news clipping in italics because it was so obviously the reason for this fatal accident. One of the first rules of safety any operator must learn and obey is never to move his vehicle unless he can see what is directly in front of him. This applies to any kind of industrial truck, carrier, train, crane, etc. If this safety rule can not be complied with because of some special reason, then another person should be stationed in such a position that he can see what's ahead and so direct the operator.

◆

Kansas City, Mo. Times:

Joe Hayward suffered a fracture of the left leg yesterday afternoon in a fall from a ladder at the Major Appliance company store at 1017 East Fifteenth, where he is employed. He was admitted to the General hospital. L. M. Anderson, a fellow employee, said Hayward was working in a storeroom when the ladder slipped and he fell.

Prevention:

For ladder safety, workmen should remember to place the foot of the ladder on which they are to work approximately one third the length of the ladder away from the wall. This distance can vary; however for real safety another man should be stationed at the foot of the ladder or the ladder equipped with ladder safety shoes, which makes it practically impossible for the ladder to slip.

TECHNICAL FILE ON SOLVENTS

E 43.—DIOXANE. The other ether of extensive industrial use, dioxane or diethylene dioxide, is considered to be somewhat more of a membrane-irritant than an anesthetic. In stupors, if the flow of mucous from the membranes is copious, pneumonia can result. The alcohol ethers, like ethylene glycol monoethyl ether, diethylene glycol monoethyl ether, and ethylene glycol monobutyl ether, are even less anesthetic. Thus, the glycol compounds, known industrially as "cellosolve," are not considered dangerous except as irritants, mainly because their low vapor pressure does not induce anesthesia. These compounds are used as wetting agents (see Index), in paints, and in anti-freeze solutions. Isopropyl ether, less known, is said by some authorities to be harmful on repeated exposures.

E 44. CONTROL. Control of the ether hazards lies mainly in good ventilation (see Index) and in careful, cool handling of the substance. Wherever possible, exhaust systems or isolation of the process should be undertaken. The most important educational point is to let the *worker* know of the *dangers* of the hazard.

E 45. ESTERS. The entire lacquer industry has been built upon the development of the esters, composed of ethereal salts of organic acids, like acetic. These substances, as a general rule, are all comparatively new and few studies have been made of their exact effects on workers. The banana-like odor so often characteristic of the esters has been either productive of a craving or objectionable to workers, but chronic toxicity or poisoning is rare. The most frequently used esters are the acetates, amyl, butyl, ethyl and methyl, and as health hazards they are considered less dangerous than solvents, such as benzol and methyl alcohol. They may act anesthetically, but there are no reported after-effects. The acetates are only slightly soluble in water, very soluble in alcohol. Thus, an equilibrium with body solution is reached early in an exposure.

E 46. EXPOSURE EFFECTS. Normal amyl acetate or amyl acetic ester ($CH_3COO(CH_2)_4CH_3$) is a colorless liquid, boiling at 147.6° Centigrade. It is irritating to the mucous membranes and is reported to induce narcosis, or a drugged numbness, and often a craving for its banana-odor. Fifty parts per million of the vapor for the work period has been recommended in Russia, 400 in the United States. The normal butyl acetate ($CH_3COOC_4H_9$) has little odor, boils at 126.5° and produces a drowsiness, beside the irritation of the membranes. 1000 parts per million for the normal and 400 for the secondary are the limits suggested in the United States. Ethyl acetate ($CH_3COOC_2H_5$) has a fragrant odor, boils at 77.15°, causes irritation and narcosis. No safe limits have been proposed. Methyl acetate (CH_3COOCH_3) also has a pleasing odor, boils at 57.1° and produces irritation (even at 1000 parts per million) and stupor. No standards have been adopted.

E 47. OTHER ESTERS. Other esters known to industry are amyl butyrate, -formate, -lactate and -propionate; butyl butyrate, -crotonate, -formate, -lactate and propionate; cyclohexanol acetate; diethyl carbonate; diethyl sulphate; dimethoxyethyl phthalate; dimethyl sulphate (see Index); ethyl acetyl glycolate; ethyl benzoate, -butyrate, -crotonate, -formate, lactate, -oxalate, -oxybutyrate, -propionate, and -silicate; furfural acetate; hexyl acetate; methoxy butyl acetate; methyl formate, -tri-hydroxy-butyrate, -lactate, and -propionate; octyl acetate; phenyl acetate; propyl acetate and -propionate; triethyl phosphate; and vinyl acetate.

E 48. WORKERS EXPOSED. Workers exposed to the ester hazards include the following:

Airplane-dope makers
Artificial-leather workers
Battery (dry) makers
Bronzers
Buffers (rubber)
Cement (rubber, plastic, etc.) mixers
Dry cleaners
Dyers
Enamelers
Explosives workers
Gilders
Leather workers
Linoleum makers
Mottlers (leather)
Nitrocellulose workers
Painters
Paint makers
Paint removers
Paper (coated) makers
Pyroxylin-plastics workers
Rayon makers
Shoe-factory workers
Soap makers
Storage-battery makers
Tannery workers
Textile printers

TECHNICAL FILE ON SOLVENTS

SAVE THIS VALUABLE REFERENCE MATERIAL: BUILD UP A PERMANENT OFFICE FILE

E 49. ADDITIONAL HAZARDS. In any ester exposure, it must be remembered that the addition of benzol, wood alcohol, or other poisonous substances, to the solvent mixture may create additional hazards. Any complaints from workers of headache or dizziness should be studied from that angle. The supervision should be informed of the nature of the product used in any department and any necessary precautions in use should be adhered to. Good ventilation and cool, enclosed or isolated processes will minimize all hazards. Ester solvents are notoriously flammable.

E 50. KETONE HAZARDS. The following table (adapted from Henderson and Haggard) of the common ketones in industry will give a quick picture of these solvents that have come into prominence with the popularity of synthetic resin coatings:

Name	*Formula*	*Boiling Point Centigrade*	*Effect*
Acetone (dimethyl ketone)	CH_3COCH_3	56.5	Anesthetic
Butanone (methyl ethyl ketone)	$CH_3COC_2H_5$	79.6	Irritant and anesthetic
Pentonone (methyl propyl ketone)	$CH_3CO(CH_2)_2CH_3$	101.7	Irritant and anesthetic
Hexanone (methyl butyl ketone)	$CH_3CO(CH_2)_3CH_3$	127.2	Irritant and anesthetic
Hexone (methyl isobutyl ketone)	$CH_3COCH_2CH(CH_3)_2$	119.0	Irritant and anesthetic

E 51. ACETONE. *Acetone* is the most common of the industrial ketones and is the most readily soluble, the solubility decreasing considerably in the higher members of the series. This compensates to some extent for the usual increase in toxicity found in the higher members of a series, making the resulting effect somewhat uniform. Acetone, though only a mild irritant, is definitely anesthetic, and is one of the few solvent vapors in this comparatively mild group that can be accumulated within the body. It is a colorless liquid with a mint-like odor.

E 52. HIGH CONCENTRATIONS. High concentrations cannot be inhaled for more than a few minutes without some discomfort and a desire for fresh air *Acute* poisoning is evidenced by loss of equilibrium and a light narcosis, or drugged effect, which deepens if exposure continues. Few studies of effects on humans have been completed, but it has been reported that acetone acts as a stimulant on the respiratory center. If other, more toxic, solvents are mixed with the acetone preparation either by design or as impurities, serious injury may result from overexposure. Prolonged exposure to low concentrations of simple acetone vapor does not appear to cause dangerous results in human beings, according to current observations. However, a safe limit of 200 parts of the vapor to one million of air has been suggested for the work period.

E 53. WORKERS EXPOSED. Workers considered exposed to the ketones include the following:

Acetylene workers
Airplane-dope makers
Artificial leather-makers
Artificial-silk workers
Bronze-powder makers
Cement (rubber, plastic etc.) workers
Collar (fused) makers
Dye makers
Explosives workers
Extractors (oils and fats)
Nitrocellulose workers
Painters
Paint makers
Paint removers
Paraffin workers
Petroleum refiners
Pyroxylin-plastics workers
Rayon workers
Resin makers
Rubber workers
Shoe-factory operatives
Transparent-wrapping-material workers
Wool scourers

E 54. ACETALDEHYDE POISONING. Acetaldehyde (known also as ethanal, acetic aldehyde, ethylic aldehyde and ethyl aldehyde) is mainly an irritant of the skin and the mucous membranes of the eyes, mouth and respiratory tract. In this respect it is similar to formaldehyde and acrolein, already dealt with in another group of toxic gases, and the other aldehydes. Acetaldehyde is one of the lower members of the series. It is more readily soluble in water and thus acts upon the wet membranes quickly. This irritation tends to drive the exposed worker to fresh air, weeping and coughing, long before the more dangerous anesthetic action begins. Three hours of exposure to a concentration of 1100 parts of the vapor to a million of air are sufficient to cause irritation in the average exposed worker.

(To be continued)

Useful Literature

UL-25 . . . Standard code symbol stamps for identifying inspectors, operations workmen, dates and specially designed stamps for indicating acceptance, rejection, deviation and other inspection markings are the subject of a colorful new folder issued by M. E. Cunningham Company.

For further information, please circle UL-25 on the special postcard enclosed in this issue.

UL-26 . . . American Optical Co. has available two two-color booklets describing the new R2000 and R5000 line of Respirators. The former has seven interchangeable cartridges to cope with various types of dusts, vapors and gases. The R5000 also has interchangeable cartridges offering the maximum in protection, convenience and comfort against various dusts, gases and vapors.

For further information, please circle UL-26 on the special postcard enclosed in this issue.

UL-27 . . . Recently published by Ansul Chemical Co., is their illustrated pamphlet describing the 12 advanced engineering design features incorporated in the new Ansul improved dry chemical fire extinguishers. These extinguishers are described as being the best protection for flammable liquid, gas and electrical fires.

For further information, please circle UL-27 on the special postcard enclosed in this issue.

UL-28 . . . Hammond Machinery Builders, Inc. have published a four-page two-color folder describing their new independent dust collecting units "DUSKOLECTORS." These self-contained units are designed to carry away dust laden air of grinding and cutting wheels, protecting employees from dust, etc.

For further information, please circle UL-28 on the special postcard enclosed in this issue.

UL-29 . . . Kirk and Blum Mfg. Co., specialists in dust control equipment for 42 years, have prepared a bulletin describing their new type "M" unit dust controllers, designed for maximum capacity and minimum space and maintenance. Cleaned air may be returned to room or ventilated to outside. After cleaner filters easily and quickly accessible. Motor and exhauster completely isolated from dust. No fire hazard.

For further information, please circle UL-29 on the special postcard enclosed in this issue.

UL-30 . . . Armstrong Machine Works has issued a revised bulletin covering its complete line of steam humidifiers, including two new air-controlled models. 12 page illustrated bulletin contains a discussion of dry air problems, tables on desirable relative humidities and complete data on Armstrong Humidifiers.

For further information, please circle UL-30 on the special postcard enclosed in this issue.

UL-31 . . . Detex Watchclock Corp. has published an interesting article entitled "Story of the Missing Link." This story gives a realistic example of what can happen to those plants which employ a night watchman yet do not take advantage of means to supervise those watchmen. The Detex Guardsman Watchclock gives unbroken mechanical supervision during long week-ends and extended shutdowns.

For further information, please circle UL-31 on the special postcard enclosed in this issue.

UL-32 . . . Buffalo Forge Company's new Bulletin 3158B describes their Central Air Conditioning Equipment. Designed for comfort cooling and industrial applications, these units combine all of the superior humidifying and cleaning features of Buffalo Air Washers with surface cooling. This 15 page bulletin is complete with photographs, atmosphere charts and graphs and installation diagrams.

For further information, please circle UL-32 on the special postcard enclosed in this issue.

UL-33 . . . ALCO-LITE Aluminum Ladders for Industry are described in a new 12 page folder just published by Aluminum Ladder Co. Folding step ladders, warehouse ladders and extension ladders are described. Weight of the ladders is given in a table of specification.

For further information, please circle UL-33 on the special postcard enclosed in this issue.

"WOVEN-Gards"

BETTER HAND PROTECTION

at amazing low cost

"Woven-Gards" are hand protectors, mitts, pads and sleeves made of a new safety material. They provide flexibility, comfort, resistance to abrasion and cutting far beyond that of anything used before. They are extremely oil-absorbent and do an excellent job when handling oily, slippery sheets. The porous weave makes them one of the finest protectors for handling lower temperatures. Enthusiastic users say they have never seen values like "Woven-Gards." Excellent protection at lowest cost. Send now for descriptive folder and prices.

Industrial Gloves Co.

1810 Garfield St., Danville, Ill.

(In Canada: Safety Supply Co., Toronto)

INDUSTRIAL Safety Apparel

. . . And Sudden Injury

Here's what a man's foot looks like after being caught without safety shoes between a falling crate and a concrete floor.

And Sudden Injury

BIG Mike gulped down the last of his coffee, used the back of his hand to brush some egg off his mouth, and then heaved a vast sigh of satisfaction. With a full belly, he was ready for a hard day's work. Mike loved his wife, his three kids and his job. He made pretty good money, was captain of the shop bowling team and stood a pretty fair chance of being made a foreman in another year or so.

As he started for work this Monday morning, Sara, his wife, said, "I'm cleaning out the back closet today, honey, and I'm going to throw away your old black shoes. They're not fit to be seen in anymore!"

"Let me have 'em," Mike answered. "They're good enough for the shop."

In the locker room an hour later, Mike took off his new and shiny street shoes and carefully placed them in his locker. He looked at the ancient pair of shoes he'd been using around the shop for 6 months, then threw them away. The pair he'd brought from home this morning were in fine shape compared to those. Of course, he wouldn't be caught dead wearing them on the street—but for the shop they were just fine. By wearing his discarded street shoes in the shop he needn't be tempted into buying those safety shoes they sold over in the safety department. Why spend six or seven bucks for a new pair of shoes for the shop? 'Course they had steel safety toes in them, but Big Mike had been working for a long time without having anything dropped on his foot, and he aimed to work a long time more the same way. A very, very good way to save money—or so thought Mike.

That very morning—about three hours later to be exact—the Super told Mike and another fellow to help unload some 150-pound crates from a truck. They got two of them off the truck in good shape. On the third one, though, something happened to Mike's helper. He tripped or slipped just as he was easing the crate down to Mike. Off balance, Big Mike struggled to keep the heavy box from falling—but it was no use. It slipped right through his arms and the metal covered corner smashed into the concrete driveway with a jolting crash. Unfortunately, Mike's toes were in the way. Over on the left is what Mike's foot looked like after they had wiped off the blood and stuff. One toe completely gone, two others smashed. And Big Mike thought he was saving money by not investing in safety shoes . . .

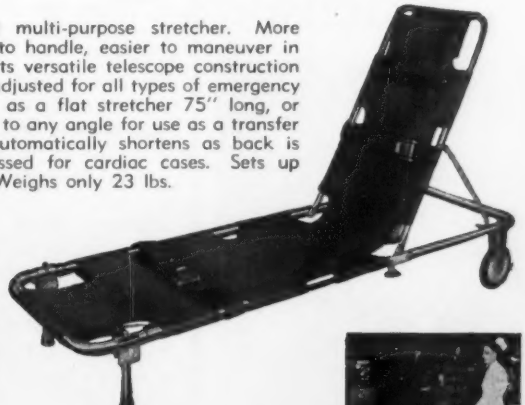
THE REVOLUTIONARY NEW ALL-PURPOSE

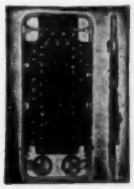
COLLAPSI-COT

EMERGENCY STRETCHER & TRANSFER CHAIR

Sets up In 10 Seconds . . . Weighs Only 23 Pounds

America's finest multi-purpose stretcher. More efficient, easier to handle, easier to maneuver in close quarters. Its versatile telescope construction permits it to be adjusted for all types of emergency carrying. Use it as a flat stretcher 75" long, or set the back rest to any angle for use as a transfer chair. Length automatically shortens as back is raised. Unsurpassed for cardiac cases. Sets up in 10 seconds. Weighs only 23 lbs.





Size opened, 75" x 20". Size collapsed, 48" x 20" x 2¼". Folds to a compact lightweight unit, easily stored on walls. Tested and proved far better in actual use, Collapsi-Cot will prove a valuable addition to your first aid equipment. Write for details, now.

EMERGENCY AIDS COMPANY

3628 N. Lincoln Avenue • Dept. O-H • Chicago 13, Illinois

DON'T CALL HIM A LIAR!

Don't accuse your Watchman of sleeping on the job, on circumstantial evidence.

Don't accuse him of shirking—unless you have proof—the proof that the DETEX GUARDSMAN gives you.

When your Watchman is supervised by the DETEX GUARDSMAN there is no room for argument. The embossed-tape record furnishes positive evidence of the Watchman's activities during every minute of his tour.

The GUARDSMAN is a blessing on long week-ends. No need for anyone to return to the plant to change the clock dial. Because the GUARDSMAN operates for as long as 96 hours, if necessary, without the necessity of cutting the tape.

The GUARDSMAN proves the worth of a good watchman and quickly exposes the shirker. Get the sense of security and protection the GUARDSMAN gives you. Save on lower insurance premiums. Write for free informative literature.

DETEX WATCHMENS CLOCKS

PATROL
ALERT
ECO
NEWMAN
GUARDSMAN

DETEX WATCHCLOCK CORPORATION
Dept. O-12
76 VARICK STREET, NEW YORK 13, N.Y.
Sales and Service in All Principal Cities

From page 15

point out features of new models, etc.

The cost of setting up such a store is not large. The number of shoes needed varies with the number of employees. The amount of space needed is not large and sales can be made without hiring extra help. Average outlay runs between seven hundred and twenty-five hundred dollars. So the cost really only amounts to the interest on this amount. The few hundred dollars is a small enough figure when compared to the thousands that can be saved each year because of the use of safety shoes.

Should the plant store idea be not feasible, management can turn to those safety shoe manufacturers whose merchandise is sold through retail stores in the larger cities. There are also some shoe representatives who visit plants periodically with a complete stock of safety shoes on display in mobile units that can be parked right in the plant yard.

There are many ways to sell safety shoes to workers if management really wants to protect themselves and their employees from foot and toe injuries. For the convenience of all concerned, OCCUPATIONAL HAZARDS Magazine gives here the **names of most of the leading brands of safety shoes manufactured** in this country, together with the persons who can give the most information to fit all individualized needs*

"HY-TEST"

NORMAN C. WHITSETT
General Manager

Hy-Test Div., International Shoe Co.,
1509 Washington Ave., St. Louis 3, Mo.

"IRON AGE"

JAMES H. CHILDS, JR.
Sales Manager

Iron Age Div., H. Childs & Co., Inc.
813 Penn Ave., Pittsburgh 22, Pa.

"LEHIGH"

FRANK B. GRISWOLD
General Sales Manager

Lehigh Safety Shoe Co., Div. of
Endicott Johnson Corporation

"SAFETY FIRST"

A. H. CRAFTS
Sales Manager

Safety First Shoe Company
Holliston, Massachusetts

"THOM McAN"

WILLIAM J. SMITH
Sales Manager

Thom McAn Safety Shoe Div.
Melville Shoe Corporation
25 W. 43rd St., New York City

* There are other types of foot protection devices on the market such as the metal foot guards manufactured by **Trinal, Inc.,** 634 N. Orleans St., Chicago, Ill., and **Elwood Safety Appliance Co.,** 295 6th St., Elwood City, Pa. **The Reece Wooden Sole Shoe Co.,** Columbus, Neb., and the **F. J. Stahmer Shoe Co.,** 2349 Boies Ave., Davenport, Iowa manufacture special safety shoes with wooden soles.

Space does not permit here the listing of the several companies who sell safety shoes under their own company name. Prominent among these is **Mine Safety Appliances Co.,** 210 N. Braddock Ave., Pittsburgh 8, Pa.

Beacon Falls Rubber Footwear, Beacon Falls 1, Conn., **Hood Rubber Co.,** 98 Nichols Ave., Watertown 72, Mass., **Iron Age, Lehigh** and many others make rubber footwear with the metal safety toe.

OHIO FIRE BRIGADE ASSOCIATION

Over 400 persons attended the First Annual Conference of the Ohio Fire Brigade Association which was held Saturday, November 5th, at Columbus, Ohio. Men interested in industrial fire prevention from the entire state of Ohio and neighboring states attended this meeting and found it a very successful one.

Mayor Jas. A. Rhodes of Columbus welcomed the members and guests of the association. Among the speakers were Maj. Norman Imrie, former Assistant State Fire Marshal; Mr. Frank Middaugh, Ohio Inspection Bureau (also on the board of directors of the N.F.P.A.); Mr. James Fluker, Director of Ohio Division of Hygiene and Safety; J. E. Frederickson, Plant Protection Chief of General Motors Corporation in Detroit; and Chief Walter Strickfadden of the Columbus Fire Department.

All the talks and round table discussions had to do with the importance of industrial fire brigades. It was certainly inspiring to hear what progress this group has made since its incorporation, approximately a year ago. More and more requests for information are coming in to this group regarding the organization of industrial fire brigades, etc.

The Ohio Fire Brigade Association is a non-profit organization devoted to the gathering and assimilation of information having to do with the most efficient means of establishing and maintaining such brigades. They have invited interested persons, regardless of their location, to write to them. It is planned next spring to conduct a school to which all members of the association will be invited to send men to be trained in industrial fire brigade activities. Announcement of the exact date is to be made later.

WHY RISK YOUR FEET WITHOUT SAFETY FIRST SHOES?

It's the Flanged Steel Toe That Saves you Woe! Stays Put under Impact!

A. DRESSTEEL Executive Dress Oxford
Tan or black calf. Single leather sole, rubber heel. Goodyear welt construction. Safety steel box toe.

B. MOCCASIN Oxford for Street and Shop
Brown Elk. Pancord outsole and heel. Goodyear welt construction, lined vamp. Safety steel box toe.

C. SAFIR LAST
Brown Elk lace-to-toe blucher "SAFIRSHU". Oil and heat resisting Neo-Cord sole and heel. Goodyear welt construction. Steel safety box toe.

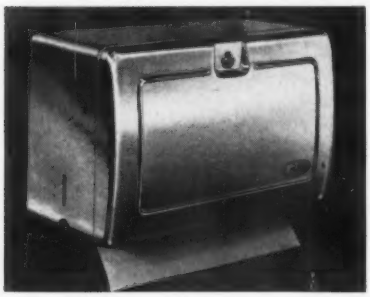
FREE! Posters for your bulletin boards available upon request.

DROP THAT GUN!
Yes sir, Brother, drop that gun
That sort of thing just isn't done.
According to the wisest sages
Loss of toes means loss of wages.
Yet there's another type of bloke
Who thinks of danger as a joke.
He comes a cropper, moans the blister-
He didn't wear his safety shoes.
SAFETY FIRST SHOE COMPANY
HOLLISTON - MASS

Safety First
SHOE COMPANY
HOLLISTON 5, MASSACHUSETTS
West Coast Branch:
Pacific Building, 16th St., Oakland, Calif.
Pioneer Manufacturers of Safety Shoes

New PRODUCTS

NP-1 . . .PAPER TOWEL AND TOILET PAPER DISPENSERS—A new, complete line of paper towel and toilet paper dispensers has been announced by Bennett Mfg. Co., custom metal craftsmen since 1906. Their paper towel dispensers are available in single-fold and heavy duty double-fold models. Available in both chrome plated and baked white enamel finishes. Lock and key



eliminate tampering. Bennett toilet paper dispensers are designed to dispense either single or double-fold toilet paper.

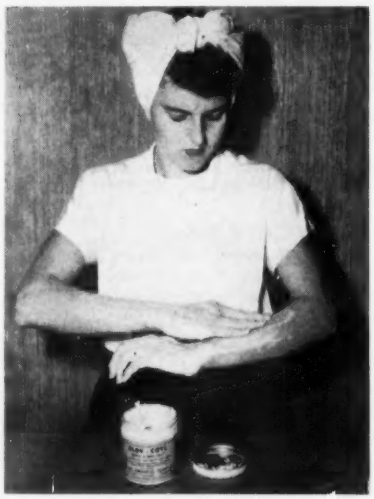
For further information, please circle NP-1 on the special postcard enclosed in this issue.

NP-2 . . . EMERGENCY FIRE BLANKET—Industrial Products Co. announces a new Roller Type Fire

Blanket for use in chemical laboratories, oil refineries, paint spray lacquer rooms and other locations where the hazard of clothing catching fire is present. It allows a man to envelope his body in a few seconds time, cutting off the air and smothering the flames. One arm is put through the blanket loop and a turn of the body is all that is necessary. The blanket automatically detaches itself from the roller.

For further information please circle NP-2 on the special postcard enclosed in this issue.

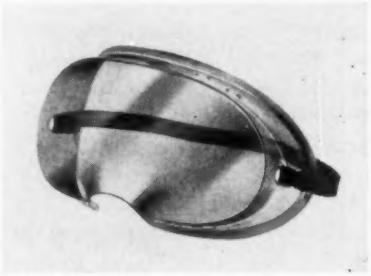
NP-3 . . . PROTECTIVE HAND AND ARM CREAM — A protective hand cream for shop use, designed to pro-



tect the skin against paints, printing inks, lacquers, grease, grime and oil has been announced by Chase Chemical Co. The new product, "Glov-Cote", acts like a glove over the hands and arms, forming a protective film that washes off easily even with cold water.

For further information, please circle NP-3 on the special postcard enclosed in this issue.

NP-4 . . . SAFETY GOGGLE—A new safety goggle, extremely light in weight but heavy in eye protection has been announced by Chicago Eye Shield Co. The new, lightweight COVERLITE weighs only 97/100 of an ounce, with this negligible weight being distributed evenly over the nose, brow and cheeks. The new COVERLITE is exceptionally sturdy. The injection moulded, non-flammable plastic frame gives full



protection from impact, dust, flying sparks and chips. Large frontal area provides wide range of vision. Has easy-to-adjust elastic headband.

For further information, please circle NP-4 on the postcard enclosed in this issue.

NP-5 . . . FIRE EXTINGUISHER—M. L. Snyder & Son, manufacturers of rubber goods, fire equipment and oiled clothing, announce production of their new STEMPEL Stored Pressure Vaporizing Liquid Fire Extinguisher. The simple trigger action fire control is a product of advanced science and engineering

skill. This product is approved by Underwriters' Laboratories and complies with I.C.C. and U.S. Bureau of Steamboat and Navigation Regulations. One quart brass finish and one and one half quart brass finish.

For further information, please circle NP-5 on the special postcard enclosed in this issue.

NP-6 . . . CHISEL GRIP—Rose Mfg. Co. announces their new SAFE-HI CHISEL GRIP, which eliminates two main chisel hazards—the flying chisel and smashed fingers. This device

holds chisels of any shape and any size up to 1 in. Flexible steel band grips chisel and cannot slip or let go. Easily and quickly put on or taken off any chisel. Single nut requires only mild tightening with fingers. Device only weighs 5 oz.

For further information, please circle NP-6 on the special postcard enclosed in this issue.

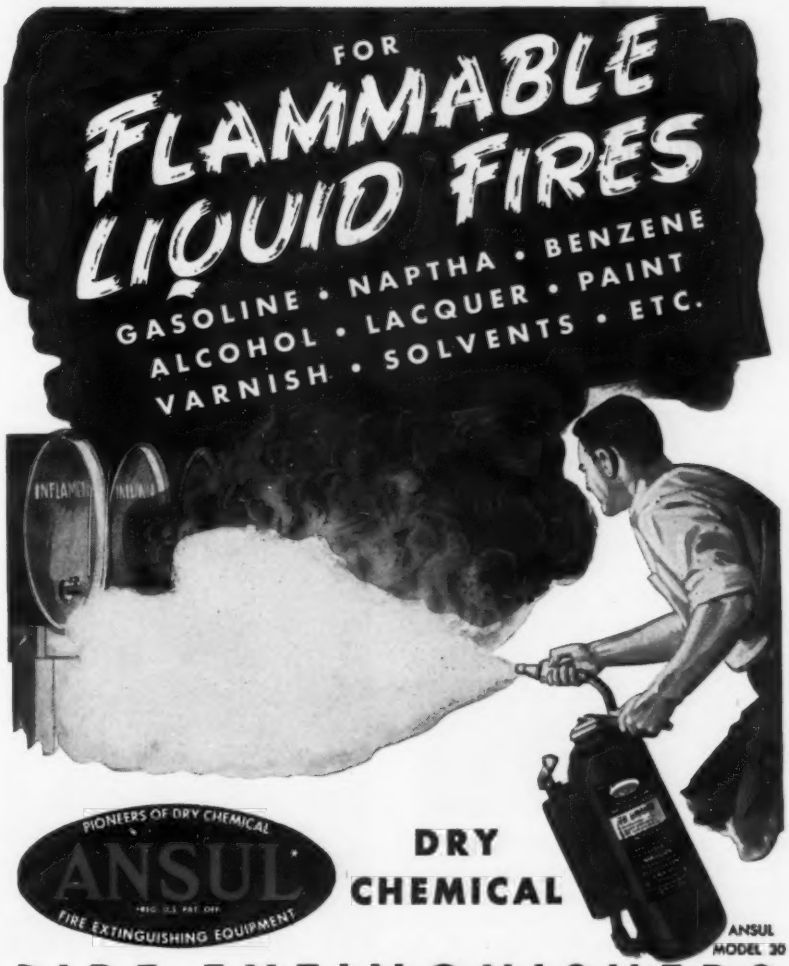
NP-7 . . . HEARING AID—Aiming at wider acceptance of hearing aids, Telex Inc. has recently introduced its newest hearing aid, the TELEX 200. The device is smaller in size than a dollar bill folded in half. weighs just 3.4 oz. without batteries.

For further information, please circle NP-7 on the special postcard enclosed in this issue.

NP-8 . . . FOAM RUBBER CUSHION—Durable Rubber Products Co. have recently introduced a factory stool cushion to relieve fatigue and give comfort while sitting. This cushion is especially designed for factory stools and is filled with foam rubber. This material retains its shape and will not mat down. Cushions are covered with long-wearing plasticized material, easily cleaned by wiping with a damp cloth.

For further information, please circle NP-8 on the special postcard enclosed in this issue.

NP-9 . . . GAS-FUME RESPIRATOR—The new M.S.A. gas-fume respirator for protection against mists, dusts,



FIRE EXTINGUISHERS ARE YOUR *BEST* PROTECTION

. . . and most economical, too! Tests conducted by impartial, nationally recognized approval laboratories have proved the superiority of Ansul Dry Chemical Fire Extinguishers on *Flammable Liquid Fires.*

In addition, Ansul Fire Extinguishers provide greater safety for the operator. The stream of Ansul Dry Chemical forms a protective screen safeguarding him against radiant heat.

More and more industrial plants, transportation companies, oil companies, etc. are switching to Ansul Extinguishers as their first line of fire defense. There is a reason.

Get the facts. Send for your copy of File No. 406. You'll also receive our latest literature together with comparative rating charts for the various types of fire extinguishers.

- Safe for use on electrical fires, too! Even high voltages are not conducted by dry chemical stream.
- Can be recharged at scene of fire furnishing continuing protection.
- Annual recharging is not necessary. Low maintenance costs.
- Longer range stream of dry chemical is effective in winds and drafts.
- Ansul Dry Chemical is non-abrasive, non-corrosive, non-toxic.
- Listed and Approved by Underwriters Laboratories and Factory Mutual Laboratories.

ANSUL CHEMICAL COMPANY
FIRE EXTINGUISHER DIVISION, MARINETTE, WISCONSIN
DISTRIBUTORS IN PRINCIPAL CITIES IN THE UNITED STATES, CANADA, AND OTHER COUNTRIES

fumes, organic vapors and acid gases which occur in burning, spraying, pouring, welding, cutting and other industrial operations is now available from Mine Safety Appliances Co. This respirator employs twin replaceable filters which are mount-

ed on the wearer's back. This position removes the filters from areas heavily contaminated and also provides unobstructed vision and complete working freedom.

For further information, please circle NP 9 on the special postcard enclosed in this issue.

NP-10 . . . FLOOR COATING—Development of a floor coating that provides a lustrous finish to floors

and yet provides a non-slipping surface has been announced by Time-Saving Specialties. The product, "NO-SLIP", is a resin water emulsion coating easily applied with mop, lambs wool or any clean applicator. Manufacturer claims it is the answer to slippery floor hazards and outwears ordinary wax two to one. Especially recommended for linoleum, asphalt and rubber tile.

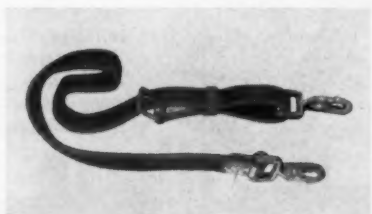
For further information, please circle NP-10 on the special postcard enclosed in this issue.

NP-11 . . . SAFETY HELMET—After more than a year of development work and rigid testing. E. D. Bullard Company has announced a new crown for the famous HARD BOILED

Hat. The material is resin impregnated Fiberglas that has proved to be the strongest, most resilient crown ever built for a safety hat. Impervious to moisture and acids, non-shattering, and non-deteriorating with age. Available in practically any color desired.

For further information, please circle NP-11 on the special postcard enclosed in this issue.

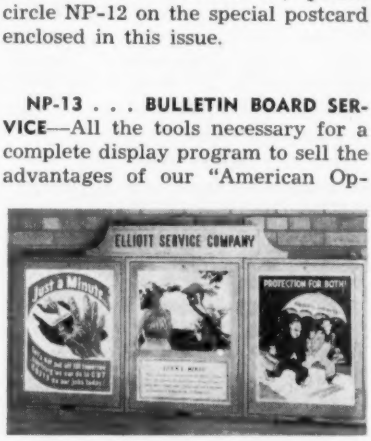
NP-12 . . . SAFETY STRAP—Final tests have been completed on the first nylon safety strap on the market, according to Buckingham Mfg. Co., Inc. Results of laboratory and field tests show exceptional quali-



ties of strength, durability and flexibility. Multiple plies of nylon are laid together in neoprene and vulcanized. Process results in ease of handling and lightness with strength.

For further information, please circle NP-12 on the special postcard enclosed in this issue.

NP-13 . . . BULLETIN BOARD SERVICE—All the tools necessary for a complete display program to sell the advantages of our "American Op-



portunity System" to employees are now available, according to Elliott Service Co. Plan includes use of a newly designed steel bulletin board, glass enclosed, with either three, four or five panels, together with 17 x 22 inch attractive multi-colored displays, currently covering "The Profit Story", accident prevention costs and waste reduction and quality workmanship. Daily change of carefully selected news pictures assures constant employee interest.

For further information, please circle NP-13 on the special postcard enclosed in this issue.

NP-14 . . . WORK GLOVES WITH NON-SLIP FINISH—The development of a highly wear-resistant non-slip finish for its Sure-seal PK Coated Fabric Work Gloves has just been announced by the Surety Rubber Company, Carrollton, Ohio. The company has succeeded after extensive laboratory research, in ap-

plying its exclusive Griptite Finish to the coating on these gloves. This gives the Sureseal PK Gloves effective gripping action in liquids, including lubricants, yet the Griptite Finish won't injure metals or machinery. In on-the-job field tests, Sureseal PK Gloves with Griptite Finish wore 18 times as long, handled 18 times as many heavy metal pieces, as stout hot mill gloves heavily reinforced with friction tape. The Sureseal PK Coating won't crack or peel, has high resistance to chemicals—far higher than rubber or standard synthetics. The Griptite Finish is cured into the coating and lasts as long as the gloves. Sureseal PK Gloves with Griptite Finish are available in knit wrist, band top, safety cuff, and gauntlet types—most styles with or without ventilated back, as desired. All styles are molded to a comfortable curved finger design.

For further information, please circle NP-14 on the special postcard enclosed in this issue.

NP-15 . . . A new 8-page illustrated bulletin, "Dings Certified Magnetic Equipment", has been released by Dings Magnetic Separator Co. Bulletin describes electric and non-electric magnetic pulleys, non-electric magnetic drums, lifting magnets, high intensity induced roll and cross belt magnetic separators and several other types of equipment.

For further information, please circle NP-15 on the special postcard enclosed in this issue.

NP-16 . . . Beacon Falls Rubber Footwear have issued a beautiful multi-colored catalog describing their complete line of waterproof footwear. This catalog includes many sportsmen's items of footwear but of special interest are the boots and pacs for rugged industrial wear. Some of these sturdy rubber boots are equipped with steel safety toe caps.

For further information, please circle NP-16 on the special postcard enclosed in this issue.

are your glove costs too high?

YOUR COST DEPENDS ON THREE FACTORS

1. *Using the correct glove for the job.*
2. *Proper stock control. A clean pair for a dirty pair.*
3. *Salvaging by proper cleaning, repair.*

Wash-Rite specializes in "Rite-to-Wear" gloves for every job. Complete stocks. Immediate shipment. We have assisted many of the country's largest industries in setting up a money saving glove control system.

"Wash-Rite" is exclusively engaged in the correct and scientific cleaning, sterilizing, repairing, reshaping and processing of industrial work gloves, aprons and other protective clothing.

CLEANERS AND PROCESSORS OF LEATHER COTTON AND RUBBER GOODS

REDUCE YOUR COSTS WITH "WASH-RITE'S" PROVEN SERVICE. SEND US A FREE TRIAL ORDER TODAY!

Wash-Rite Company, Inc.
1412-26 CORNELL AVENUE · INDIANAPOLIS 2, INDIANA

There's No "CURE-ALL" IN CUTTING OIL SANITATION

Shop conditions vary widely—so do coolant handling problems. To prevent costly coolant spoilage with its foul odors and to maintain practical sterility, your Dolge Service man is prepared to render this service:

He will take samples of your coolant for free bacteriological and chemical examination in Dolge laboratories.

You will receive a complete confidential report, including the bacterial count.

Only then, and when found necessary, the particular DOLGE STERIDOL GERMICIDE to fit your requirements will be recommended. Employed as directed, the preparation will not irritate the skin or corrode metals . . . and it will prevent spoilage . . . at the cost of less than 1 cent per gallon of coolant.

Write for "Cutting Oil Sanitation"

STERIDOL
THE C. B. DOLGE CO.
WESTPORT, CONNECTICUT

INDUSTRY News

Elected AMC President . . .

Dudley W. Moor, Jr., former vice-president of American Mat Corporation, Toledo, has been elected president. He succeeds E. M. Belknap, who died recently.

District Managers For Buffalo . . .

Buffalo Fire Appliance Corporation, Dayton, Ohio, announces the appointment of two new district managers.

E. C. Purnell is now in charge of the North-Central Territory with headquarters in Chicago. Mr. Purnell has been in mill supply and automotive supply sales work for many years. During the war he was a special civilian instructor for certain aircraft installations.

John S. Chapman will take over Buffalo's South-Eastern territory with headquarters at Memphis, Tenn. Mr. Chapman has been in the fire equipment sales field for some time and also has been sales manager of an automotive equipment manufacturer.

Ansul's President Dies . . .

F. J. (Jim) Hood, President of the Ansul Chemical Company, suffered a fatal heart attack at 7:30 on the morning of Thursday, November 10th. The popular 44-year-old president died in New York City. On his way to attend the 6th All-Industry Refrigeration and Air Conditioning Exposition in Atlantic City, his death was entirely unexpected and the news of it came as a great shock to the many who knew him.

Mr. Hood was a graduate of the University of Wisconsin and also attended Carroll College in Waukesha. He joined the Ansul Chemical Company when he was 23 years old. He was promoted to secretary-treasurer in 1938; promoted to the position of vice president in 1945 and elected president in 1948.

Mr. Hood was an ardent sportsman and all-around outdoor man. He was a past president of REMA, a member of the Kiwanis, and President of the Riverside Chamber of Commerce, Menominee, Wis. He was also Director of the First National Bank of Marinette, Wis.

COAL REFUSE FIRES . . . Dr. E. R. Weidlein, Director of Mellon Institute, has announced the establishment of a research fellowship which will embrace scientific studies of the causes, prevention and control of coal refuse fires. Dr. William L. Nelson, who will head the fellowship, will investigate the reactions of coal and inorganic sulfides, especially at low temperatures, and will record research on all factors entering into the problem of spontaneous combustion of coal waste, particularly where heaped or piled.

THE NEW SAFETY "UTILITY"
MARKING OUTFIT

Holder Holds Nine Sizes of Type From 1/32" to 1/4"

Designed for light stamping work, the "Utility" outfit is ideal for marking etched plates, tags, keys, stock checks; brand names or stock numbers on steel bars; special coding, serial numbering, identification, inspection and other marking where two or more characters are required.

Send for Literature and Prices

M.E. CUNNINGHAM CO.
SAFETY STEEL STAMPS

91 E. CARSON STREET PITTSBURGH, PA.

PLANT MAINTENANCE SHOW

Cleveland, Ohio, January 16-19

Many subjects of vital interest to personnel and safety directors will be on the program for discussion at the first Plant Maintenance Show, which will be held in the Auditorium, Cleveland, O., Jan. 16-19.

The four-day exposition, which will be held concurrently with a four-day conference, is the first ever devoted exclusively to maintenance. The program will be sponsored jointly by the American Society of Mechanical Engineers and the Society for the Advancement of Management. The Cleveland Engineering Society will be hosts at a dinner for visitors. L. C. Morrow, editor, Factory Management and Maintenance, will be general chairman of the conference.

Topics scheduled for discussion include "Maintenance Organization and Management;" "Budgeting the Maintenance Operation;" "Selection and Upkeep of Lighting Equipment;" "Upkeep of Motors, Controls and Distribution Equipment;" "Using Electrical Instruments in Maintenance;" "Upkeep of Floors, Walls and Roofs;" "Protection, Decoration and Cleaning of Surfaces;" "Sanitation and Housekeeping;" "Lubrication;" "Application of Service Equipment;" "Protecting the Plant," and "Protecting the Worker."

More than 100 exhibitors will give demonstrations of machinery, materials and methods for reduction of costs in plant maintenance.

LITERATURE FEATURED IN ADS THIS MONTH

The publications listed below are available to readers without charge. **Simply circle on the postcard provided in this issue the number of items you wish to receive,** and send it to OCCUPATIONAL HAZARDS, 1240 Ontario Street, Cleveland 13, Ohio. Your request will then be forwarded directly to the companies concerned.

A-1 . . . "Dust Collecting Systems in Metal Industries" is a new booklet offered by Kirk and Blum Mfg. Co., designers, fabricators and installers of dust control systems.

A-2 . . . Information about how to sell safety shoes to employees is offered by Thom McAn Safety Shoe Div.

A-3 . . . A free sample of West's Lan-O-Kleen hand cleanser along with a fact-packed booklet is offered by West Disinfecting Co.

A-4 . . . Complete new catalog showing 43 different styles of safety boots and shoes is now being offered by Lehigh Safety Shoe Co.

A-5 . . . Literature to help maintenance operators in the proper use of maintenance equipment is available from Finnell System, Inc., pioneers and specialists in floor maintenance equipment and supplies.

A-6 . . . Hy-Test have recently published a free catalog describing their complete line of Hy-Test safety shoes and telling about their money back guarantee.

A-7 . . . Where to Use, How to Use and How to Select Industrial Protective Equipment is "must" reading for every safety engineer. Available from Chicago Eye Shield Co.

A-8 . . . E. & J. Mfg. Co. offer a complete set of literature describing techniques of resuscitation and the E. & J. Resuscitator.

A-9 . . . New catalog by Willson Products, Inc. gives product information on safety glass, filter glass, respiratory hazards, etc., which will help you select proper safety equipment to meet specific hazards.

A-10 . . . Catalog No. 8, 64 pages in full color about the Stonehouse line of signs for accident prevention is available upon request.

A-11 . . . C-O Two Fire Equipment Co. have available literature describing their brand new dry chemical type fire extinguisher, which is a self-contained unit, Underwriters' Labs approved.

A-12 . . . An important bulletin for all those interested in low-cost, adjustable ventilators is Bulletin 3720, available from Buffalo Forge Co.

A-13 . . . From Trinal, Inc. literature is available describing the efficient and highly impact resistant metal foot guard, designed to protect the entire foot.

A-14 . . . Descriptive folder and prices of the Industrial Glove Company's line of "Woven-Gards" hand protectors, mitts, pads and sleeves is now available.

A-15 . . . Details on the revolutionary new all-purpose Collapsi-Cot, the emergency stretcher and transfer chair now available from Emergency Aids. Co.

A-16 . . . Free safety posters designed to sell workers on the need of safety shoes are available to readers of OCCUPATIONAL HAZARDS from Safety First Shoe Co. upon request.

A-17 . . . Ansul Chemical Co. have published literature, together with comparative rating charts, for various types of fire extinguishers. File No. 406 describes techniques in fighting flammable liquid fires.

A-18 . . . Wash-Rite Co. Inc. invites free trial orders for scientific cleaning, sterilizing and repairing industrial work gloves, aprons and other work clothing.

A-19 . . . Safety engineers interested in the hazards of cutting oil from a dermatitis' standpoint—and what to do about cutting oil sanitation, write for booklets offered by C. B. Dolge Co.

A-20 . . . Informaive catalog now available from Pioneer Rubber Co. describes their Neoprene line of Stanzol Gloves.

A-21 . . . Illustrated catalog of safety work gloves, finger protectors and safety apparel available from Olympic Glove Co.

A-22 . . . Acme Protection Equipment Co. have prepared a booklet giving a complete story on Acme Gas Masks for all occupational hazards.

A-23 . . . Free samples of Dionol Ointment for industrial burn cases offered by Dionol Pharmacal Co.

A-24 . . . Bulletin M-129-A gives complete details on the Industrial Products Company's Utility Rainsuit, which is designed to be worn over regular clothing.

A-25 . . . Complete safety equipment catalog now available from the Dockson Corp., specializing in "Better-Built" head and eye protection.

A-26 . . . Williams Jewelry & Mfg. Co. offer a catalog listing their complete line of safety badges, designed to suit every purpose.

A-27 . . . Bausch & Lomb catalog on industrial eye-wear includes a highly informative discussion on the theory and design of protective industrial eyewear, besides listing the complete Bausch & Lomb stock.

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ACCIDENT PRONENESS

From Page 24

following tabulations:

	YEAR—7/1/47—6/30/48			
	No. Reported Injuries	Injuries Per Man-Year	Injury Rate Million Man Hrs.	Injury Rate Million Man Hrs. Plant Average
Group A	46	1.15	564	1041
Group B	189	4.73	2316	
	YEAR—7/1/48—6/30/49			
	No. Reported Injuries	Injuries Per Man-Year	Injury Rate Million Man Hrs.	Injury Rate Million Man Hrs. Plant Average
Group A	37	.93	453	797
Group B	160	4.00	1961	

In analyzing the results, these enlightening comparisons were found:

During the first year the ratio of injuries between the groups was 1 to 4.11; the second year, 1 to 4.32. Accidents plant-wide decreased 23% the second year as compared to the first; in the A Group the decrease was 20%, while in the B Group it was 15%. The A Group was 46% under plant average in accident frequency the first year, 43% lower the second. The B Group's frequency was 122% higher than plant average the first year and 146% higher the second. The accident frequency rate of B Group was 310% and 333% higher than the A Group.

Two disabling injuries occurred during the two years in the B Group, none in the A Group. Also of interest is the fact that one of the B Group members suffered a disabling injury on June 28, 1947, just three days before the study began.

Conclusions

From the above it is readily apparent that we have individuals working in the plant having the same experience, doing the same work and having the same exposure as other individuals in the same departments, who get hurt four times as often as some of their fellow workmen. It is also clear that these "accident prone" employees do not respond to training and accident prevention efforts as readily as their fellow employees.

We have passed this information along to department managers, general foremen, shift foremen and others responsible for safety in our plant. *The study makes it clear that supervision must take cognizance of the fact that certain of their employees are more prone to become involved in accidents than others. These individuals must be known to the supervisor and he should keep this fact in mind when making work assignments and when issuing instructions. These accident prone individuals must be more closely supervised and extra supervisory effort is required to keep them free of injury.*

ELEVATOR HAZARDS

From Page 25

nearly one-half of these resulted from persons tripping while getting on or off the car where no automatic leveling was provided. Automatic elevators accounted for only 7.45% of the total serious and fatal accidents on all freight and passenger elevators and only 4% of the total fatal accidents. One of these resulted when a man working on top of the car fell when the car was started by a person at a landing. The other was a child's death caused when its carriage was caught between the car platform and top of the hoistway door opening because the car door contact and hoistway interlock contacts were grounded and did not operate.

Very Few Hurt Riding on Elevators

Of the 287 elevator accidents covered in the Otis survey, only 26 involved persons actually riding on elevators and accounted for only 9% of the total. Only nine of the 26 were serious or fatal, there being 3 serious and none fatal on passenger elevators; 3 serious and 3 fatal on freight elevators. Four of the passenger mishaps occurred with overloaded cars and, while there were 6 accidents in this class caused by broken hoist ropes, none of these occurred on modern, traction-type elevators.

Carelessness caused many of the accidents in all categories. A man on a freight elevator was carrying a length of pipe on his shoulder; the pipe projected through the car gate and caught under the landing sill. In another case a man climbed over a hoistway gate and fell five floors onto the top of the car. Another workman on top of the car stuck his head over the side of the car and was struck by a descending counterweight, while yet another man working on a scaffold in a hoistway leaned over into the adjacent hoistway and was struck by a descending car.

Proper Safeguards Essential

A summary of all fatal and serious elevator accidents analyzed by Otis engineers in the past three years showed that 60% occurred at hoistway or car entrances in 1946, 84% in 1947 and 85.6% in 1948. The three-year average was 76.5%.

The summary for all elevator accidents, including minor, showed that 87.5% occurred at hoistway or car entrances in 1946, 84.3% in 1947 and 85.4% in 1948. The three year average in this case was 85.7%.

Commenting on these findings, Otis analysts said:

"It is obvious that the greatest reduction in accidents can be secured by properly guarding the hoistway and car entrances."

Sub-Standard Safety Equipment

"Most of the reported entrance accidents occurred on old elevators with sub-standard safety equipment at the hoistway and car openings. There will be little reduction in the number and severity of elevator entrance accidents unless something is done to increase the safety of the large number of old sub-standard installations still in operation."

"A large number of serious and fatal accidents occur each year due to persons opening hoistway doors with emergency keys or by screw drivers or other simple tools. These accidents can be prevented by prohibiting the use of such emergency devices and by providing a safe means which will permit qualified persons to open the hoistway door only when the car is at the landing where the door is to be opened."

The number of serious and fatal accidents directly traceable to lack of safety devices, and which could have been prevented with adequate safeguards which are required on new elevator installations, was 67.1% of the total in 1948; 66.7% in 1947.

IT'S HOT OUTSIDE!

From Page 22

run on the two outer brinks of the closed-hairpin-like pit. Continuously, twenty-four hours a day, the slag is dumped into the pit from these cars. An electrically-driven shovel then picks up this slag and dumps it into cable-drawn cars that run on a track at grade level between the two trenches. The slag is dumped from these cable cars into a hopper that feeds a crusher.

The hot slag in a solidified state in the pit is sprayed with water to aid in digging. Mingled with the steam that rises from the hot mass are the fumes that had been carried away by the slag. The concentrations of these fumes are such as to require that all electrical connections and terminals be coated with a special protective covering.

Before installation of the air conditioner in the cab, two huge propeller-type fans were mounted on the shovel in an effort to blow away the fumes, dust and steam. The effectiveness of these fans depended much upon the direction of the wind, but at best only partially alleviated the conditions.

Besides the gases, the cooling slag gave off considerable heat, especially as the shovel exposed the hotter slag near the bottom of the pit.

When Duquesne Slag Products Company purchased a new shovel recently, they called in the Dravo Corporation to install a Dravo crane cab cooler. Only minor modifications of the crane cab cooler were necessary to adapt it to the cab of the slag shovel.

The machinery and equipment of the shovel itself left no room in the machinery compartments to install the cooler. Therefore it was installed on the roof of the cab. This placement offered important advantages. With the unit directly on the cab roof, an eight-inch long duct was all that was needed to reach the air diffuser in the center of the ceiling. In this position, the three-directional diffuser delivers 400 cfm of air that actually washes the surfaces of the walls and floor of the cab, removing the heat they have absorbed from the hot slag. The return air opening is located 12 inches from the floor, and the duct is within the cab so that it need not be insulated except for that short section from the roof to the cooling unit.

Locating the unit on the roof of the cab also makes maintenance

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easier than it would have been in a confined place.

The shovel's original equipment includes its own filtering and air-handling system to supply air free of dirt to the machinery compartment for the protection of bearings, commutators, brushes and other moving parts. This unit also is located on the roof. An axial flow fan draws outside air through 4-inch thick graduated wire-mesh filters and delivers it to the shovel machinery compartment under a slight positive pressure. This pressure keeps non-filtered air from getting into the compartment.

The cab conditioning unit operates with three-fourths return air from the cab and one-fourth makeup air. This makeup air is obtained from the shovel conditioning unit and already has been filtered. However, it is again drawn through a 2-inch thick wire mesh filter and 4 activated carbon fume removal canisters before being mixed with the return air. The 25 per cent of makeup air is considerably more than is required for ventilation, but is necessary in order to pressurize the cab and prevent infiltration of dust and dirt, fumes and gases. After passing through the cold-section intake, this mixture of return air and makeup air is then drawn through another 2-inch filter, through the evaporator and then delivered to the diffuser in the operator's cab to complete the air flow cycle.

Because makeup air for the unit was obtained from the machinery compartment of the shovel, and also because the unit would be exposed to the weather, the usual louvered panels enclosing the condensing section and the control enclosure were replaced with water-tight solid panels. In operation, the shovel sometimes assumes attitudes as much as 20° from the horizontal, both fore and aft, and this required the relocation of the Freon-114 liquid pick-up tube so that it would not rise above the receiver liquid level and suck uncondensed refrigerant gas. The Freon receiver is cylindrical and mounted parallel with the side of the shovel, therefore lateral attitude of the shovel is not critical in that respect.

The unit is air cooled. Air is used for condensing the refrigerant and no water is required in any way. A large, double-inlet, double-width squirrel-cage fan pulls air from the shovel machinery compartment and discharges it across the condensing coil. A 5-hp motor drives, through V-belts, the compressor, condenser air fan, and ventilation air fan for the motor and control enclosure. A forced ventilating system provides 60 to 62° air from the conditioning section of the cooler into the motor casing. Dust, dirt and fumes have been removed from this air and the brushes and moving parts of the motor turn over without undue wear, and in air free from corrosive gases. The 1/3-hp air supply fan is in the cool air stream to prevent overheating.

Air in the cab is held constant at 80° by a thermostat mounted on the return air duct in order not to be affected by heat radiation from the steel wall and ceiling partitions. A three-position switch permits conditioned air fan operation only, or conditioned air fan operation with the refrigeration compressor cycling off and on automatically as demanded by the thermostat. Operation of the unit is independent of operation of the shovel itself.

As an equipment protective measure, the cooler and all structural steel installed to support it were painted in the same matching color and fume-resisting formula that was used on the shovel itself.

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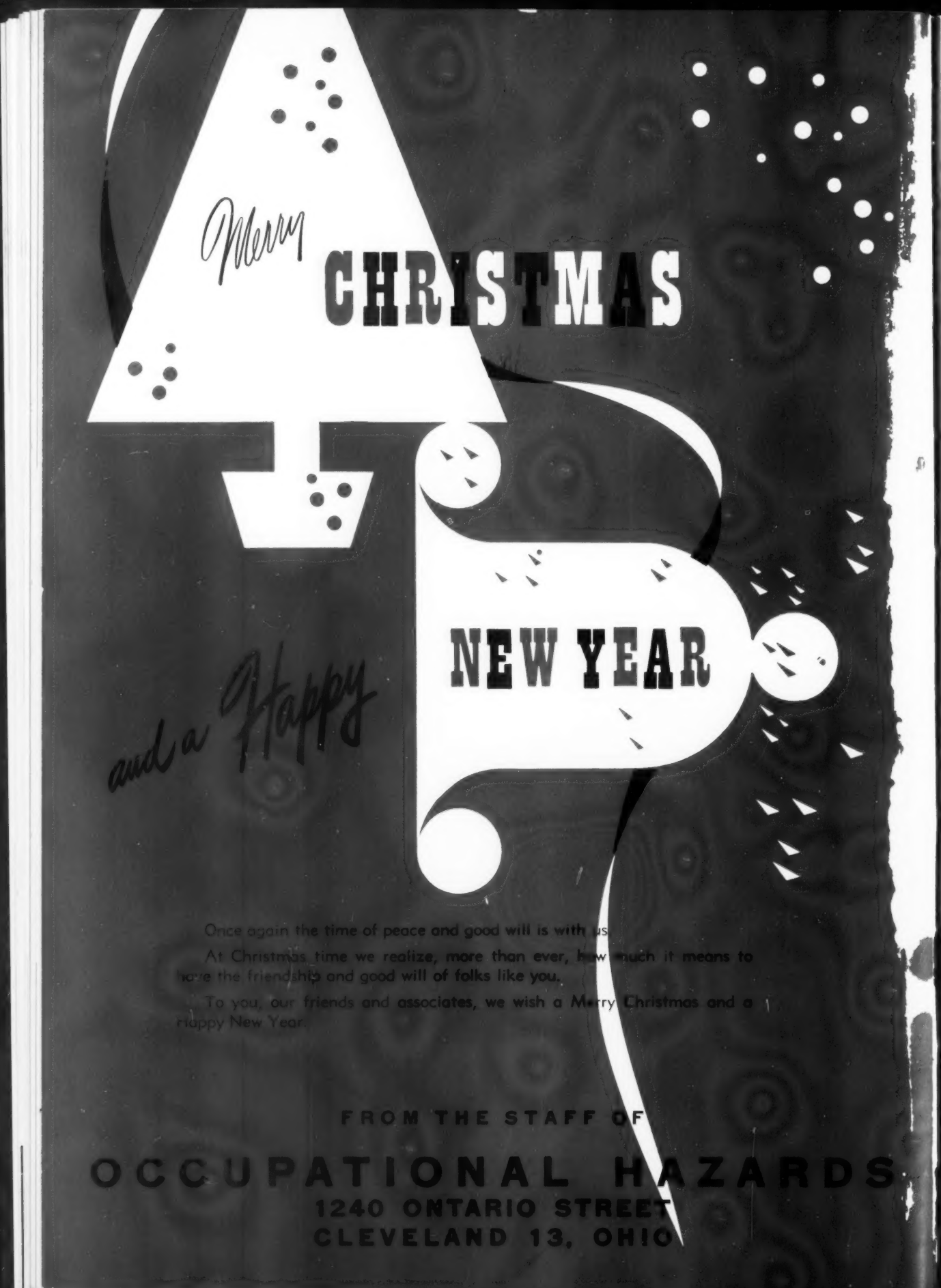
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